THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

VOL. XVIII. No. 439—21st YEAR.] LONDON, AUGUST 17, 1869. [Subscription per Ann. { 15s. in Advance / 18s. Credit.] DOUBLE No. Price 1s.

RAMSAY'S NEWCASTLE CANNEL COAL. Analysis—
10,000 cubic feet of gas per ton of coal.
26-candle gas.
13¼ cwt. coke per ton of coal.
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DO. GARESFIELD COKE.

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FIRE-BRICK WORKS, established 1804.
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The Fire Clay is worked from Blaydon Main Colliery, is of excellent quality, and no expense spared in perfecting every article.
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Patentees of the Standard Gasometers for the Government, and of the
IMPROVED DRY GAS-METERS.
These Meters are warranted to measure correctly and not to vary, and have come into general use more rapidly than any Meters hitherto manufactured.

PARIS EXHIBITION, 1867.
THE TESTING-HOUSE REPORTS.
The Reports prepared for the Science and Art Department, under the direction of the Lords of the Council, detail the arrangements made for testing the gas apparatus exhibited. In the testing-house erected by the Special Committee appointed to further this object a gasholder was constructed by Mr. G. Glover, being a *fac simile* of that produced and patented by him in 1860, and deposited in the Exchequer, under the provisions of the Sales of Gas Act, and British manufacturers of gas apparatus were invited by advertisement, and by direct application, to forward worthy objects for exhibition. Mr. G. Glover was, however, the only manufacturer who sent Meters to be tested. The report states that, as "Mr. Glover is a manufacturer of Dry Meters only, no opportunity presented itself of comparing their accuracy with that of Wet Meters under various circumstances, but the perfection to which that maker has brought his Meters prevents the possibility of those extravagant errors which are well known to exist where Wet Meters are used."
Particulars and lists of prices forwarded on application to Ranelagh Works, Ranelagh Road, Pimlico, LONDON, S.W.; 15, Market Street, MANCHESTER; or 97, Boulevard de Magenta, PARIS.

COWEN'S PATENT FIRE-CLAY RETORTS.
JOSEPH COWEN and CO.,
BLAYDON BURN, NEAR NEWCASTLE-ON-TYNE,
Were the only parties to whom a PRIZE MEDAL was awarded at the GREAT EXHIBITION of 1851, for "GAS RETORTS and OTHER OBJECTS in FIRE-CLAY," and they have also been awarded in the INTERNATIONAL EXHIBITION of 1862, the PRIZE MEDAL for "GAS RETORTS, FIRE-BRICKS, &c., for EXCELLENCE of QUALITY."
J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts in the United Kingdom; and orders for Fire-Clay Retorts of all shapes and dimensions, Fire-Bricks, and every other article in Fire-Clay are promptly executed at their Works as above.
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Coal Office,
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THE OLD TUBE WORKS,
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ALMA WORKS,
WALSALL, STAFFORDSHIRE;
and 69, UPPER THAMES STREET, LONDON,
Original Manufacturers of Wrought-Iron Gas Tubes and Holders of the present Patents; Inventors and First Makers of LAP-WELDED FLUES for Steam Boilers.
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Gun Metal, and all other kinds of Cocks, Stocks, Dies, and Taps, Galvanised Tubes, &c.
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AND
STREET-LAMP
MANUFACTURERS,
BELL BARN ROAD, BIRMINGHAM.
ESTABLISHED 1830.
All materials found for the alteration of Public Lamps for lighting with the Rod. Regulators with Lava Burners.

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NEAR NEWCASTLE-ON-TYNE.
WILLIAM COCHRAN CARR begs most respectfully to thank the Metropolitan, Provincial, and Continental Gas Companies for their patronage for several years past, and to intimate that he has rebuilt and enlarged his extensive premises for the manufacture of CLAY RETORTS; and that he is now prepared to execute the largest orders with punctuality and despatch. Orders for FIRE-CLAY RETORTS, of all shapes and sizes, FIRE-BRICKS, and all other articles in Fire-Clay, executed on the shortest notice, and on the most reasonable terms.
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THE "LOTHIAN" CANNEL COALS.
These Cannels are extensively used in the Gas-Works of Edinburgh, where the illuminating power of the gas is the highest in Britain.
The yield per ton is 12,573 cubic feet; illuminating power 33·8 standard candles; coke per ton 1046 lbs.
Ports of Shipment, in the Firth of Forth.

BO'NESS CANNEL COALS.—This Cannel is largely used in gas-works where, in addition to high illuminating power, there exists a demand for superior Coke, it being the best Coke-producing Cannel of all Scottish Cannels. It yields about 11,000 cubic ft. of 25 standard candle gas per ton.
Ports of Shipment, either the Forth or the Clyde.
Apply to J. and W. ROMANS, 53, Frederick Street, EDINBURGH; & 1, Walbrook, Mansion House, LONDON.

NOTICE.
LESMAHAGO GAS OR CANNEL COAL.
JAMES FERGUSON & CO., Auchinheath COLLIERY, LESMAHAGO, and the NITSHILL & LESMAHAGO COAL COMPANY, AUCHINHEATH AND SOUTHFIELD COLLIERIES, LESMAHAGO, sole Proprietors and Producers of the above celebrated GAS COAL, beg to intimate to Gas Companies and other consumers that, having reason to suspect that Cannel or other Coal of very inferior quality, both as regards the quantity and illuminating power of the Gas, has frequently been mixed with and sold under the name of "Lesmahago," they have now appointed Messrs. JAMES LAWRIE & Co., of 63, Old Broad Street, LONDON, E.C., sole agents for England; and Messrs. LA COUR & WATSON, of LEITH, sole agents for foreign markets; and, in order to prevent a recurrence of the frauds named, they request that all purchasers will send their orders through the above-named firms. Orders for other than the above-named markets may be forwarded direct to either of the Proprietors.
The Proprietors will, in future, use their own forms of bills of lading, and also issue certificates of origin, signed, as the case may be, either by JAMES FERGUSON & Co., or by the NITSHILL & LESMAHAGO COAL COMPANY; and they request all consumers purchasing Lesmahago Coal to demand such a certificate for each cargo, and to observe that it corresponds with the bill of lading.
Auchinheath, Lesmahago, March, 1868.

GEORGE GLOVER & CO.,

Patentees of the Standard Gasometers for the Government,

TWO MEDALS,

LONDON, 1862.

HAVE OBTAINED THE

HIGHEST

PRIZE

FOR

SILVER MEDAL,

PARIS, 1867.

IMPROVED DRY GAS-METERS AND GASOMETERS,

AT THE

PARIS EXHIBITION.

RANELAGH WORKS, RANELAGH ROAD, PIMLICO, LONDON, S.W.;
AND 127, BOULEVARD DE MAGENTA, PARIS.

JOURNAL OF GAS LIGHTING NEWSPAPER

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N.B.—A Stock of 15 and 16 in. CIRCULAR RETORTS always on hand. Other kinds made to order on short notice.

SILVER MEDAL, PARIS EXHIBITION, 1867.

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ALBION TUBE-WORKS, BIRMINGHAM,

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WROUGHT-IRON TUBES AND FITTINGS

For Gas, Steam, Water, &c.

SOLE LICENSEES for the United Kingdom for the LAVENANT PATENT ENAMELLED TUBES & FITTINGS,

the Coating of which does not shell off, is a certain preservative from rust, and resists all effects of expansion and contraction.

LAP-WELDED IRON & HOMOGENEOUS METAL TUBES

For Locomotive, Marine, and Stationary Boilers.

Boiler-Tube Ferrules, Gun-Metal Gland Cocks, Water-Gauges, Whistles, &c.; Stocks, Taps, and Dies for Screwing, and Gas-Fitters Tools of all kinds.

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PATENTS FOR CHARGING AND DRAWING GAS-RETORTS,

WITH CHAMBERS FOR MOUTHS,

REQUIRING NO LUTING.

Gas Engineers are solicited to examine into the merits of this invention before erecting new or altering old retort-houses. It may be seen in action at the Alliance Gas Company's Works, Dublin, where its utility and economy will be clearly demonstrated. Although the saving in labour will be considerable, and quickly return any outlay of capital, there are other and important features strongly recommending its adoption at all gas-works, and which a gas engineer upon examination will at once appreciate.

The Directors of the Alliance Gas Company have kindly consented to give every facility to gentlemen desirous of seeing the invention in operation. Parties, therefore, about to visit Dublin will be so good as to send us their card, and we will furnish them with letters of introduction.

Drawings, &c., may be seen at our Office, and all details explained.

JOHN CHISHOLM, SON, & CO., 44, MARK LANE, E.C.

1862.

PATENT ANTIMONY PAINT.

MADE ONLY BY

GEORGE HALLETT & CO.,

296, ROTHERHITHE, LONDON, S.E.

CLASS II.

This Paint having been in general use over seven years (especially in some of the principal Gas-Works), and proved itself the best light-coloured Paint produced for resisting the influence of vitiated atmospheres, it is important that its qualities should be more widely known.

It is not discoloured like white lead in a sulphuretted atmosphere, nor washed off like white zinc; and its light colour reflecting heat, produces much less expansion of gas in holders painted with it than with dark colours, besides rendering them much more sightly. Its specific gravity is so much below white lead that the same weight will cover one-third more surface, while it is equal in body; and its price being about the same (30s. per cwt.), it is actually one-third cheaper. From experience, its manufacture is greatly improved, and it is quite suitable for all purposes in which white lead is employed.

Reference is kindly permitted by the Engineers of the City of London, Commercial, London, and Surrey Consumers Gas Companies, who pronounce it the best Paint known for their purposes.

N.B.—Antimony Paint, COVERING SO MUCH MORE WORK, costs about 20s. per cwt., as compared with White Lead at 30s. per cwt.; a similar economy arises from its use in Steam and Gas Joints, for which purpose it is superior to White Lead.

J. & J. BRADDOCK,

GAS ENGINEERS,

GLOBE METER-WORKS, OLDHAM,

MANUFACTURERS OF

IMPROVED CONSUMERS GAS-METERS,

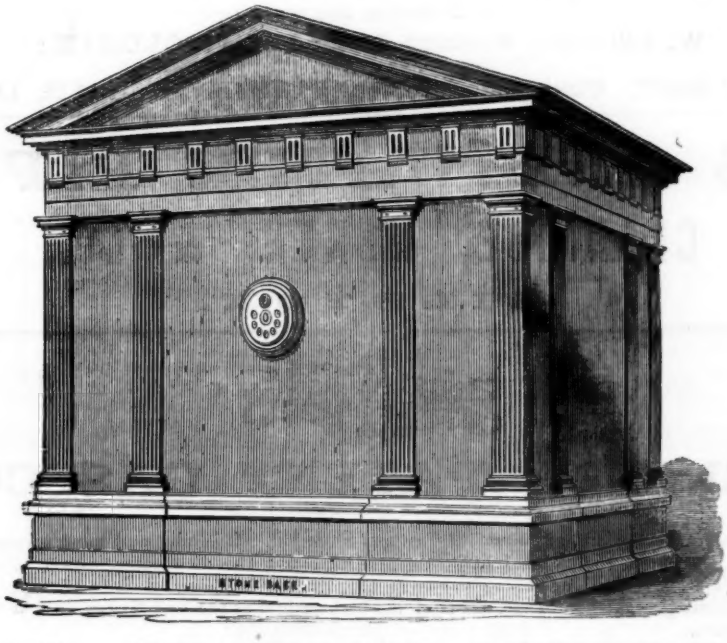
Of the Best Material and Workmanship, carefully adjusted to the requirements of the British Sales of Gas Act and Foreign Standards of Measures.

PATENT COMPENSATING GAS-METERS,

Which are uniform with the Ordinary Meters, and register with minute accuracy.

IMPROVED DRY GAS-METERS,

IN BEST TINNED IRON CASES.



GAS STATION-METERS,

ALL SIZES, WITH PLANED JOINTS.

GOVERNORS, GAUGES, INDICATORS, EXHAUST-GOVERNORS, &c.

Home and Foreign Orders promptly attended to. Terms, &c., on application.

MESSRS. J. & J. BRADDOCK,

Tender their grateful acknowledgments for the past generous and extensive patronage conferred on their firm, and beg to assure their Friends, Gas Engineers, and Gas Companies generally, that every exertion will continue to be made to maintain the sterling quality of their work in every department.

Their ORDINARY METERS, WET and DRY, have now a demand over that of any other maker in the North of England; and their STATION-METERS stand unrivalled for Design, Sound Workmanship, and Efficiency.

All sizes of CONSUMERS METERS generally in Stock.

STATION-METERS, in round or square cases, on the Shortest Notice.

GEORGE NEWTON,

(Late Senior Partner of the Globe Meter-Works,)

UNION STREET WEST, OLDHAM,

MANUFACTURER OF

IMPROVED WET & DRY CONSUMERS GAS-METERS,

GAS STATION-METERS,

With all the Joints planed,

GOVERNORS, GAUGES, INDICATORS, EXHAUST GOVERNORS, &c.

TERMS, &c., ON APPLICATION.

THE GAS-METER COMPANY

(LIMITED), LONDON,

(Successors to CROLL, RAIT, and CO., LONDON, and WEST and GREGSON, OLDHAM.)

MANUFACTURE

STATION-METERS & GOVERNORS

At their Oldham Establishment, which has long possessed the reputation of supplying this description of apparatus of the most perfect construction and appropriate design.

CONSUMERS GAS-METERS IN CAST-IRON & TINNED SHEET-IRON CASES.

STREET GOVERNORS, PRESSURE and EXHAUST REGISTERS, TEST GASHOLDERS,

AND EXPERIMENTAL GAS APPARATUS GENERALLY.

For information, &c., apply to

W. ARCHER, Manager, Meter Factory, OLDHAM;

OR TO

GEORGE RAIT, Managing Director, KINGSLAND ROAD, LONDON.

GAS AND WATER PIPES.

CLARIDGE, NORTH, & CO.,

BILSTON.

M'KENZIE'S PATENT GAS COAL.

This Patent Gas Coal is a compound of Pulverized Coal and Shale Oil. It is now used most successfully by some of the London Gas Companies, and also in Dublin and other places, for increasing the illuminating power of the Gas, which it does at less cost than Cannel Coal. The illuminating power of this Patent Coal can be made of any strength required up to 35 candles, and is in all cases guaranteed. The Coke is of the best quality, as the best Newcastle and Sunderland Coals only are used in the manufacture.

This Patent Coal is shipped at Sunderland, where works for its manufacture have been erected.

Further particulars can be obtained from

W. W. JOBSON, 16, Fish Street Hill, LONDON; or

WALKER, BRUCE, & CO., Patent Gas-Coal Works, South Docks, SUNDERLAND.

EXTRACT *from the Inaugural Address of* THOMAS G. BARLOW, Esq., C.E., *President of the British Association of Gas Managers, at their Fifth Annual General Meeting, held in London on the 2nd of June,* 1868.

Gentlemen,—In considering the progress that has been made in the manufacture and distribution of Gas during the past year, the new inventions and new processes which have been adopted or tried with prospect of success, deserve to be specially noticed. Foremost among them is M'Kenzie's process for producing Gas of high illuminating power from small Coal, mixed with crude Shale Oil. The pressure which the Legislature has recently put on Gas Companies to raise the standard of illuminating power considerably above that obtainable from common Coal, has compelled most of them to use a certain proportion of Cannel Coal, at a heavy loss, and with a diminution in the value of the Coke. The advance in the price of Cannel Coal, consequent on the increased consumption, has stimulated inquiry to find a substitute for it; and this seems to have been accomplished by Mr. M'Kenzie, whose process has been successfully adopted on a large scale at the Alliance Gas-Works in Dublin. The small Coal is well mixed with the Oil, in the proportions varying from 10 to 30 gallons of Oil to one ton of Coals. This is effected by means of a mixing or grinding mill. The Compound material is then distilled in ordinary Gas Retorts of clay or iron, at a strong heat. I have recently witnessed an experiment on a mixture of Llantwit Small Coal shipped at Cardiff, and costing in Dublin 12s. 6d. per ton, with 5 per cent. of Broxburne Shale Oil, costing £5 10s. per ton, the produce of the distillation of one ton of which mixture was—

9750 cubic feet of Gas, 21·5 Candles illuminating power.
37 bushels of good hard, saleable Coke.
2 bushels of Breeze.
11 gallons of Tar.
15 gallons of Ammoniacal Liquor, of 5° Twaddle.

The cost of this mixture, including Royalty, was about 17s. per ton, against 24s. for Wigan Cannel, over which it has the advantage of at least 5s. per ton in the value of the Coke.

FOR SALE,

SEVERAL SECOND-HAND STATION-METERS & GOVERNORS,

All in excellent Working Order, equal to New, guaranteed.

APPLY FOR FURTHER PARTICULARS TO

GEORGE RAIT, Managing Director, GAS-METER COMPANY,
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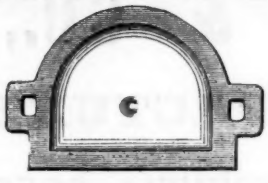
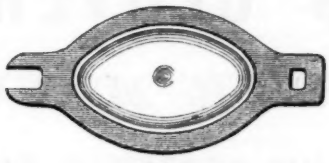
OR TO
WILLIAM ARCHER, THE OLDHAM METER MANUFACTORY, OLDHAM.

PIGGOTT'S IMPROVED RETORT-LIDS.


Convex


Rabbeted

Dished

The Manufacturers desire respectfully to call the attention of Gas Companies and Engineers to their Improved Retort and other Stamped Wrought-Iron Lids, which possess the following advantages over Wrought Lids hitherto manufactured:—Uniform size and shape, a smooth and even surface, and a superiority of finish hitherto unattained. These desirable qualifications are preserved *irrespective of form*.

The Manufacturers have recently laid down extensive Hydraulic Machinery, with a view to acquire the above result, and the success they have achieved in this branch of their business has surpassed their most sanguine expectations. The simple fact that these Lids fit into one die, and are stamped and cut out at one blow, is a sufficient proof that they must be necessarily alike in all respects, and superior to any other make.

The following Gas Companies have the Lids in use, and can certify to their merits:—

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Beverley,	Bury,	Gloucester,	Nottingham,	South Shields,
Birkenhead,	Carlisle,	Harrogate,	Nuneaton,	Southampton,
Birmingham and Staffordshire,	City of London,	Huyton and Roby,	Perth,	Stockton,
Bombay,	Cowes,	Leeds,	Preston,	Tunbridge Wells,
Bradford,	Croydon,	Leicester,	Portsea Island,	Victoria Docks,
Brighton,	Crystal Palace,	Liverpool,	Rossendale,	Warrington,
Brighton and Hove,	Derby,	Longport,	South Metropolitan,	&c., &c.
	Equitable, London,	Lowestoft,	London,	

PRICE LISTS ON APPLICATION.

THOMAS PIGGOTT & SON,
ENGINEERS, CONTRACTORS, and IRONFOUNDERS,
GASHOLDER, GAS APPARATUS, & STEAM-ENGINE BOILER MAKERS,
SWALLOW FOUNDRY, SPRING HILL, BIRMINGHAM.

LIVESEY FIRE-CLAY WORKS,
NEAR BLACKBURN, LANCASHIRE.

ORLANDO BROTHERS,
MANUFACTURER OF PATENT CLAY RETORTS,
AND EVERY DESCRIPTION OF
TUBULAR GLAZED SEWERAGE PIPES, BENDS, JUNCTIONS, ETC.
FIRE-BRICKS, TILES, BLOCKS, AND CHIMNEY-TOPS.

DRY GAS-METERS IN CAST-IRON CASES,
MANUFACTURED BY
WILLIAM AND BENJAMIN COWAN,
(ESTABLISHED 1827,)
BUCCLEUCH STREET WORKS, EDINBURGH,

Possess a simplicity of construction and facility for repair greater than any yet produced, while the excellence of the material and workmanship, and accuracy of registration, cannot be surpassed. The superiority of their Dry Meters in Tin Cases is also well known.

SOLE MANUFACTURERS OF
ESSON'S PATENT COMPENSATING GAS-METERS.
COWAN'S PATENT SIDE-VALVE GAS-METERS.

THE

UNIVERSAL EXHIBITION OF PARIS,

1867.

SILVER MEDAL.

THOMAS GLOVER & CO.,

DRY GAS-METER MANUFACTURERS,

214 TO 222, ST. JOHN STREET, CLERKENWELL GREEN,

LONDON,

HAVE BEEN AWARDED THE HIGHEST PRIZE FOR

DRY GAS-METERS,

BY THE IMPERIAL COMMISSIONERS FOR THE

UNIVERSAL EXHIBITION, 1867.

WILLIAM PARKINSON AND CO.

(SUCCESSORS TO SAMUEL CROSLEY),

PATENT WET AND DRY GAS-METER MANUFACTURERS, &c.

COTTAGE LANE, CITY ROAD, LONDON, E.C.

Established 1816.

PATENT IMPROVED WET METER.

W. P. and Co. invite especial attention to this Meter, which entirely overcomes the difficulty to which ordinary Wet Meters are subjected, owing to the short range of the Float, which is necessary, in order to meet the requirements of the Sale of Gas Act.

"It is well known that n Meters constructed so that the valve will close when the water is drawn off to such a point as to render them 3 per cent. slow the lights are liable to be extinguished by the closing of the valve by a sudden increase of pressure. To meet this difficulty, Mr. Pinchbeck has invented an ingenious and simple arrangement by which the action is reversed, and any such increase of pressure, in his Meter, raises the value instead of depressing it. The fact of the improvement having been adopted by Messrs. W. Parkinson and Co. is a sufficient guarantee that it practically and effectually remedies the inconvenience it is designed to meet."—JOURNAL OF GAS LIGHTING.

PATENT IMPROVED DRY METER,

Which W. P. and Co. pledge themselves to manufacture with the same quality of materials and workmanship as in their Wet Meter, thereby giving Gas Companies and others the advantage of procuring a first-rate Dry as well as a Wet Meter, which, hitherto, they have been unable to do.

STATION-METERS AND GOVERNORS.

Which can be seen at all the London Gas-Works. Also Liverpool, Manchester, Sheffield, Nottingham, Belfast, Glasgow, Birmingham, Dublin, Bristol, Leeds, Leicester, Brighton, Southampton, Sunderland, Wolverhampton, Bradford, Norwich, &c., &c.

TEST GASHOLDERS, EXPERIMENTAL METERS, EXHAUSTER REGULATORS,

MINUTE CLOCKS, PRESSURE GAUGES, PHOTOMETERS, PRESSURE REGISTERS, &c.

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No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

NOTICES.

The subscription to the JOURNAL is 15s. per annum, if paid in advance during the month of January, or 18s. credit, in two sums of 9s. each, in July and January of each year. Post-Office orders should be made payable at the Money-Order Office, London, to William B. King, 11, Bolt Court, Fleet Street, by whom the business department of the JOURNAL is conducted.

Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

The next number will be published on Tuesday, August 31, and the subsequent numbers on each successive alternate Tuesday.

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All communications for the Editor to be addressed, "No. 42, Parliament Street, Westminster;" and all remittances for subscriptions or orders for advertisements to the Publisher, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, AUGUST 17, 1869.

Notes upon Passing Events.

THE session of 1869 will be remarkable not only for what was done, and for the preparations then made for future legislation, but for the new style of manners and management introduced by the Reform Bill Ministers. With what mournful regret must the respectable commercial gentlemen who are, or grow into, directors of the Bank of England, look back to the days of Lord Melbourne, when the whole art of Government consisted in making things pleasant, and, as much as possible, "letting "sleeping dogs lie." A banker can always bear to be lectured by a lord, especially when the lecture ends in a good financial operation; but it must be very hard lines to be not only lectured, but cross-examined by a Chancellor of the Exchequer, who has not the slightest claims to aristocratic distinction, and who was an Oxford "coach"—the banker would say, with a sneer, a schoolmaster—when our banker was already a personage of some importance in the City. Mr. Lowe will not leave any institution in his department alone, until he has brought its operations to the test of common sense; there is not an atom of veneration or respect for antiquated humbug in his composition. He is not even afraid of Lord Overstone, who would be very much like the Chancellor of the Exchequer if he were of the same age, and had never had more than a thousand a year. For the first time within the memory of man, the Bank of England has had to take the advice of, instead of advising, a Chancellor of the Exchequer. After giving forty reasons why the dividends on the National Debt should not be paid by crossed cheque to those who preferred that mode of payment to personal application, the Bank has eaten the leek, and consented to what, had there been the least spirit of improvement in the Bank Parlour, would have been done years ago. The branches of the Bank of England in Liverpool, Manchester, Birmingham, Leeds, &c., are also to pay dividends due in those districts. What a pity it is that Mr. Thomson Hankey, ambitious as he is of reputation, did not find pluck enough to propose a change that must have often occurred to him. It would have done him more credit as a financier than the celebrated reform which signalized his year as Governor, by which he cut off the Christmas-boxes of the clerks, and compensated the unfortunate victims of retrenchment with a library!—not a stone, but books, instead of bread. Mr. Lowe's other theory of paying the dividend quarterly will next be realized, to the great comfort of small fundholders—a sort of people whose position it is extremely difficult for a Bank director to realize.

But Mr. Lowe has other eggs in his basket, to be hatched in due course, with Heaven knows what consequences. Thus, under a clause in a consolidation Act, the Government has taken power to borrow from other than the Bank of England; so we may live to see the great joint-stock banks—the objects of the particular aversion of the Bank of England—competing for Government business. The golden sovereign is doubly threatened. Mr. Lowe has no prejudice in favour of gold, and has no objection to the cheaper medium of one-pound notes. The difficulties he considers matters of detail, and the prejudices against convertible paper merely the tradition of the days when paper was inconvertible by Act of Parliament. A golden sovereign wears out, and soon loses twopennyworth of value; but a bank note of one pound value does not cost more than a penny at first, and may be destroyed, but can scarcely be injured in value. Pound notes circulate in Scotland and Ireland, and could not be abolished in Scotland without creating serious discontent. What a start the shade of Sir Robert Peel would give to see England infected by the Scotch bank-note disease, as he considered it; while the shade of Sir Walter Scott, the Malachi M'Growler, would rejoice. Stranger things have come to pass. The obstacle lies in the facility for forgery. Can science meet this? But Mr. Lowe's ideas extend beyond the limits of this island. He has been a traveller in Europe, Asia, and America, and looks favourably on an international coinage—a dreadful heresy in the eyes of your genuine banker. Lord Overstone, cleverest and stiffest of *doctrinaires*, will surely have something to say against reducing the value of the golden pound, when next the House of Lords meets, to receive and baptize the innocent Bills ruthlessly slaughtered during the past month.

During the recess the Government must think seriously about finding a place where Mr. M'Cullagh Torrens's undoubted talents may be made useful. Mr. Torrens's perseverance in representing the prejudices of the most ignorant of his constituents, as regards Finsbury, has been beyond all praise from them. Once he beat the Government, but on a second trial, with the assistance of Mr. Ayrton—that wild elephant now tamed—and Sir William Tite, the Government were able to reverse Mr. Torrens's most illogical conclusion—

illogical because ratepayers who are constantly complaining of metropolitan taxation protest against that process of resale of land improved by a park, which alone can diminish the cost of making parks. Probably Sir William Tite hit the right nail on the head when he suggested that the agitation was paid for by speculators who had built on the south side of the road, and wished to improve their property by having a park made, at public expense, as frontage. Finsbury Park, less 20 acres, will still be larger than St. James's or the Green Park. It is disgusting to hear the supporters of Mr. Torrens's motion drawing invidious comparisons between the advantages in parks of the West and the East-end. Kensington Gardens, Hyde Park, the Green Park, and St. James's Park were protected from building speculations by being the private pleasure-grounds of the Sovereign. A happy series of accidents has thrown them open to the public. A man must be blind who does not see that they are used all the year round more by the lower orders than the upper classes. Indeed, it may be said that, in the season, fashionable and well-dressed people, on foot, on wheels, and in carriages, perform dramas for the amusement of spectators of all classes. The same sort of cant was heard at the Salisbury election, where the Honourable Dudley Ryder, the manager of a Land Reclamation Company, showed his fitness for a legislator by protesting against the Budget, which repealed the tax on hair powder and reduced the tax on carriages, as a rich man's Budget. Thus, to serve their ends, both Liberals and Conservatives descend to unworthy claptrap.

The Endowed Schools Bill was the greatest practical measure of the session. Next to it must be ranked the new Bankruptcy Bill—the one manufacture of the House of Lords. The Habitual Criminals Bill is a great experiment on the side of honest people. It is a reaction against the ill-directed humanitarianism which has almost made criminals our masters. Habitual criminals are to be hunted down, registered, photographed, and arrested without notice and on suspicion. If it does not work, it must be made to work. Mr. Hadfield protested, of course, on behalf of felonry. His humanity has pity for every human being except an Episcopalian parson. As some one said in the smoking-room, "Mr. Hadfield is so zealous "a Nonconformist, that he would sooner pardon a murderer "than pension a bishop." This is too bad; we do not think that Mr. Hadfield, had he been a Jew, would have cried "Give us Barabbas."

It seems that the site of the law courts is as far from settled as ever, and that the battle between the lawyers of Lincoln's Inn Fields and Messrs. Lowe and Layard will recommence next session. We thought, when the papers first curtly stated that the select committee had reported against the Howard Street site, that all was over; but presently first the report and then a rejected draft were published, and it turns out that the committee did not compromise, but fought out a fight of foregone conclusions. Everybody voted for the Carey Street site who had spoken against it in the House of Commons, amongst whom were Mr. Layard's two predecessors at the Board of Works. So the Government were out-voted, the draft report presented by Mr. Lowe rejected, and the report of Sir Roundell Palmer adopted *en bloc*. Well, the judges, the suitors, and the legal profession, having waited so long, can afford to wait a little longer.

The Conservators of the Thames, in their annual report, have called attention to the injury inflicted on the navigation of the Thames by the Battersea and Fulham Bridges, especially since the use of steam-tugs for towing barges has become frequent. We have before mentioned that these hideous and dangerous bridges are the great impediments to the introduction of a better class of passenger boats on the Thames, for which the facilities of the Thames Embankment piers offer so much encouragement. Perhaps in the end these bridges may so deteriorate as to be open to indictment as nuisances, and the proprietors may be compelled to rebuild them on a more rational plan. If we remember rightly, it is one of the duties of the Metropolitan Board to suppress all toll bridges within their district. In the present state of their finances the operation seems likely to be remote. If, however, iron bridges of flat form, with few arches, were to replace Battersea and Fulham, with tolls reduced to one-half the present charges, the public on land and on water would be well satisfied.

The Conservators are evidently not able to report positively that the London sewage is filling up the tideway at Barking; and, until they can, we fear that no amount of nuisance to the dwellers on the shores of the Thames will stir Parliament to sanction further expenditure on the main drainage. Why the Metropolitan Board should be so anxious to prove the absolute perfection of a work for the plan of which they are not responsible, is difficult to understand. Perhaps they are protecting the *amour propre* of their engineer; perhaps they are anxious to show the metropolitan public that they do not seek to spend any more millions on a work which makes so little show, although it does credit to all actively concerned in it, as far as it goes. Sooner or later, the sewage must be led toward Maplin Sands, which spread out hungry, ready to receive all that is not absorbed by farmers on the way. In the meantime it is not a little amusing to hear the number of persons who are sounding through the press trumpet-notes of encouragement to towns and Local Boards to invest in sewage farms. If we wanted an example of the small influence of literary arguments, where the public is not in the humour to invest, we should cite the sewage question. Not acres but square miles of printed matter have been published to show what fortunes were to be made, what vast revenues realized, in reduction of rates, by sewage farming; and yet, beyond the old familiar thrice-told tale of Croydon, we only find Wolverhampton and Coventry reported as *about* to do something. Yet something must be done, and that soon, by the towns on the banks of the Thames.

Dublin is one of the cities vexed by its sewage, as we learn from one section of a very thick and formidable report, printed, without any regard to expense, in great luxury of type, illustrations, and paper—the "Report to the Right Hon. the "Lord Mayor, Aldermen, and Councillors of the City of "Dublin, on the General State of the Works of the City," by Parke Neville, C.E., City Engineer, a document full of useful information. We do not know whether Mr. Neville is an Irishman—we have no doubt he is an excellent engineer—but he does not possess the facility of expression which most Irishmen seem to enjoy as a part of their nature. The Corporation of Dublin appears to be in a very impecunious condition, as Mr. Neville pathetically states and restates at least once in every division of his report. With respect to sewage, Mr. Neville proposes to follow the not too fortunate example of the Metropolitan Board of Works—to spend out of a sewer-rate £4000 a year in a main drainage scheme which he has matured in conjunction with Mr. Bazalgette, and to obtain powers to raise another rate of 3d. in the pound. He "does "not mean to recommend that the Corporation should take "lands or undertake the utilization of the sewage, but simply "to point out the advantages which may result hereafter *by* "*granting a concession of it to really solvent and responsible* "*parties!*" The italics are ours. We were thinking of Mr. Ellis—Alnaschar Ellis—and his friend, Mr. Baxter Langley. What a chance for them! In the matter of repair and maintenance of streets, the Corporation of Dublin appear to labour under peculiar difficulties. "The streets, when handed over "to them in 1851 by the old Paving Board, were in the worst "possible condition," and, by some process very difficult to understand—it is explained in a paragraph filling three-quarters of a page, without one full stop—the traffic of the streets has increased, and the income from rates has diminished. Patriotism cannot, it seems, be actively employed in paving. The native granite, admirable for building, is a failure when applied to streets, and Mr. Neville has been obliged to employ Welsh stones, laid down under the superintendence of "a fore-"man pavior and two journeymen from Liverpool." In Dublin, following the example of London and the large towns of England, the speed at which loaded carriages, light and heavy, carrying merchandise, travel, is much more rapid than a few years ago. They are built lighter, set on springs, and, instead of going at the rate of two or three miles an hour, travel five or six miles an hour. The Corporation "are prevented by "want of means" from contracting with one responsible person for all the stone they require for macadamizing the streets. "The present system of obtaining macadamized "material is most objectionable. The stone is got from a "number of contractors, of very small means. Each of these "has a limited number of horses—one, two, or three—and, as "they cannot afford to allow these horses to be idle, having no "other work for them, their object is to force the macadamizing "material in equal quantities on us all the year round; and, "whenever it is found expedient to diminish or increase the "quantity, there is always great difficulty, trouble, and annoy-"ance with the contractors." This sort of system is, we are told, also one of the difficulties of Irish railways. It is not

usual, and scarcely lawful, to buy in the cheapest market. Mr. Neville has tried a preparation of coal tar, miscalled asphalte, with macadam; it does not seem to have answered on streets of much traffic. When a little more experience has been acquired, he entertains a hope that "it may prove a clean "and economical description of footpath." Contracting for scavenging was tried, but failed, because the committee had not sufficient funds to pay for the complete cleaning of all the streets, but only for a sort of average cleaning—the object being "to get as much work done as the moneys at the "disposal of the committee could afford to allocate for the "purpose. Under such a state of things it must be easy to "see the difficulties that were sure to arise when complaints of "dirty or dusty streets arose; and, until the Corporation can "afford to allocate to the scavenging such a sum as would "enable the committee to contract for the scavenging of all the "streets every day, and to keep down the dust, irrespective of "the number of times in the day the streets may require to "be watered, I consider it will prove more satisfactory to "keep the work in your own hands, although I am quite "aware that a contractor can get more work done by his "men and horses, than any public or private body will through "men and horses employed by themselves." The rise in wages in Dublin since 1859 is estimated by Mr. Neville at fully 25 per cent.; so that "if it required "£8000 per annum to execute the scavenging and watering "of the city twelve years ago, to do the same work now will "cost £10,000 per annum." The difficulty which presses so heavily in London of finding places to deposit and get rid of mud and dirt is also felt in Dublin, and Mr. Neville suggests the use of barges, to which also London must soon resort, to dispose of rubbish when every hole and hollow within six miles has been filled up. New streets are much needed in Dublin, which would "tend to rescue from decay portions of "the city which have much declined in prosperity;" but funds are wanting, and applications in 1854 for aid from Imperial resources were unsuccessful. Between 1851 and 1868 nearly 1500 buildings were reported as ruinous and dangerous to passengers. The owners of property let out in lodgings to the poorer classes, chiefly consisting of buildings which were once mansions, often "utterly ignore such obliga-"tions as keeping the roof water-tight, the sashes, floors, and "doors in decent order, the walls whitewashed, or the privies "clean." There is one circumstance (this is truly Irish) which mitigates the evil—that, *as a rule, the back buildings or out-offices have fallen from decay, leaving large open spaces for the circulation of air.* It is not only to meet the case of such rookeries that the Corporation of Dublin requires new powers, but also to regulate new buildings. Mr. Neville says, "In a "newly built house I found joists three inches deep by one "and a half wide, used to support a floor of twelve feet span!" The Corporation of Dublin seems to have been much vexed by a Mr. James Malley, a troublesome person who was always getting up schemes for the improvement of the city. Sometimes they managed to put him down, but on other occasions they were obliged to take the wind out of his sails by imitating his plan, and leaving him his pains for his reward. For instance, the cattle market was utterly insufficient for the trade of Dublin. In 1861 Mr. Malley obtained a Bill for erecting a new cattle market. The Corporation opposed him, at a great expense, in both the Houses of Commons and Lords. When defeated, they lost no time in constructing a market, which the author of the report designed, capable of accommodating 3000 cattle and 10,000 sheep. Already the trade of the city has outgrown this new market. Mr. Malley's scheme fell dead under the tardy activity of the Corporation. In 1860 this same Mr. Malley and others obtained a Bill for the establishment of large covered markets; however, nothing further was done in the face of a hostile Corporation, although the city engineer reports that "there is no city in the United Kingdom worse "off for good general markets than Dublin. Even Cork and "Belfast have fine markets." Dublin may find one consolation in the circumstance that London is equally deficient. The last part of the report is devoted to a description of the admirable water supply which Dublin obtained, after a characteristic acrimonious contest, at a cost of rather less than £600,000, or at an annual cost of about £1 19s. per head—the cost in Glasgow being £3 10s.; Manchester, £2 5s.; and Liverpool, £3 per head. Mr. Neville sums up his report by saying that the Corporation have given an ample supply of pure water at high pressure—have extended the benefits of sewerage to almost every part of the city—have erected a new cattle market—and obtained gas for the citizens, of improved illuminating power, at a reduced rate—viz., 16-candle gas at 4s. 6d. Dublin seems to require more money to expend on paving, mending, and cleaning its streets—a Building Act less onerous and absurd than that of London—powers for inspecting and regulating lodging-houses and the closets of poor houses, such as is now so advantageously exercised in the City of London—the erection of model lodging-houses suited to labourers earning not more than 2s. a day—and public wash-houses. With such work to do, the Corporation of Dublin may wisely leave politics alone for a season.

The Scotch are, without doubt, the most successful nation in the world, both at home and abroad. They have made a country poor in soil and inclement in climate prosperous in agriculture and manufactures, and able to lend money to its richer neighbours. The Scotch were the first who popularized education, and who applied science and skill to agriculture; they bred James Watt, although it was in England, with an English partner, that he flourished and became famous. With all their claims to respect, and importance, it is droll to see how, when they meet, they "*caw*" each other and ignore the claims of the rest of the world. During the Peninsular War it seemed, according to newspaper reports, that all the victories were won by Scotch regiments; the secret being that the art of writing was much more common among Scotch than English privates, and so scores of Sandies were continually recording the brave deeds of their countrymen and of no one else. The Duke of Buccleuch gave a remarkable illustration of this habit of self-praise last week, at the dinner of the Royal Highland Agricultural Society. In proposing the health of the absent president, the Marquis of Tweeddale, his grace referred to the magnificent collection of agricultural implements and machinery in the show-yard, and took occasion to refer to two of the most important improvements of this generation—viz., corn-cutting machines and steam cultivation. With these he coupled the names of the Marquis of Tweeddale and the Rev. Mr. Bell, two Scotchmen, in such a manner as to lead to the impression that they had had something to do with those great aids to agriculture. He mentioned no other names. It is quite true that, at least thirty years ago, the Marquis of Tweeddale had the courage to attempt steam cultivation on his estate at Gester; but he failed utterly, made no steps towards the solution of the problem, and, when a useful steam cultivator was first invented, gave the weight of his high authority to four horses and against its use. The Rev. Mr. Bell, some forty years ago, invented a very ingenious corn-cutting machine, which the Highland Society rewarded with a gold medal. It was not needed in the then state of the labour market, was laid aside and forgotten, until the American inventions of M'Cormick and of Hussey (on quite a different plan) popularized the idea of machine-reaping, and brought Bell's machine from its obscurity. Improved by the Englishman Crosskill, it maintained for a time a struggle against the American plan; but it has now fallen entirely out of use, except on the huge and flat farm of some ultra-patriotic Scotchman, where a machine pushed before horses can do the work nearly as well as a machine drawn by horses. The Scotch still retain their reputation as farmers, supported by a very superior class of labourers; but it is a curious fact that the best iron ploughs, harrows, seed-drills, and threshing-machines are made by English manufacturers, although all were in common use in Scotland before they were accepted in England. However, the Duke of Buccleuch no doubt knows his countrymen, and, having incurred a certain degree of unpopularity at the last General Election, he felt that the safe way to the cheers of his hearers was to ignore all outer barbarians, and attribute all agricultural progress to Scotchmen only.

The success of England in the manufacture of agricultural implements since 1840 is probably due to the possession of a body of mechanics trained in the work of producing railway locomotives and the textile machinery of Lancashire. Lord Stanley, who is accepted as an oracle on economical subjects by a great many people of all shades of politics, has been delivering himself on the question of peasant proprietors. He observes that agriculture, as at present conducted, with the view of getting the greatest amount of produce at the least expense, requires capital, and especially capital in machinery, which peasants cannot purchase or employ. Therefore, to divide the land now cultivated in farms of from 150 to 2000

acres into plots of 50 acres, would be to retrograde in productive power. The poetical idea of the country divided into little farms, which each peasant should own, and cultivate with a plough made with his own hands, drawn by a couple of bullocks, or, as on the Rhine, milch cows, would mean less meat and less corn for the country. When people point to Belgium, and tell you that there, under garden culture, the produce per acre is more than in England on soil of the same character, they beg the whole question by asserting what is not true. But there is another side of the question. Although large farms, whether arable or grazing, are essential for the progress of agriculture—that is, for the production of the greatest amount of produce under the most unfavourable circumstances of soil and climate—there cannot be a doubt that the manner in which the agricultural labourer has been expelled from the even temporary possession of the soil, in some counties, has had a most injurious effect in a moral and social point of view. There are counties where the labourer rarely owns a garden; where a pig is forbidden, lest it should tempt him to steal his master's corn; where a cow's grass is impossible, or only granted as a favour; where the allotment ground, far from his cottage, is hedged in with all manner of restrictions; and where, in fact, the whole policy of the local rulers is to make the man entirely dependent on weekly wages, eked out by the degrading charities of coal clubs, blanket clubs, and baby-linen-lending clubs. In such counties the agricultural labourers are whining beggars, without spirit, and without any sense of personal dignity. No wonder that they crowd the beer-shop and the poorhouse. Very different is the condition of the peasantry in hilly wooded regions, like Kent and Sussex, where the contour of the ground does not tempt landowners to absorb every cottage garden and paddock; so the roadside and sequestered lanes are continually enlivened by nicely hedged plots, where every kind of useful vegetable is grown, and flowers of choice kinds adorn the porch and edge the walk in front of the entrance; a pig grunts in the sty, and very often a rude but comfortable shed of mud and brambles contains a hardy little cow. These people are independent, not much given to touching hats, but they are not beggars; they open a gate, or render any small service to a traveller, without holding their hands for the "pint o' beer." The children look healthy, poultry abound in the hedgerows, and altogether the people are in a superior condition to the landless, gardenless labourers in counties where wages in money are as high or higher. We shall be glad to see the day when emigration, or any other cause, compels farmers to afford the garden, the pig, and the cow's grass.

THE WATERS OF LONDON.

It was not to be expected that the Registrar-General would allow the remarks of the Water Commission on his monthly returns to pass without notice, and we had the opportunity of publishing the official reply in our last number. The document calls for little notice, since it is merely a repetition of the assertion of the danger of using water possibly contaminated by sewage, persistently made in the monthly returns. We must not be thought to defend the pollution of rivers with sewage, but still we are at liberty to regard it as more than doubtful whether it has ever been proved that any real connexion has existed between the use of an impure water and an outbreak of cholera. When the Registrar-General asserts that the "ill effects of sewage water are illustrated by the expe-" rience of the Broad Street pump, which poisoned hundreds " of men, women, and children," he states that which is entirely unsupported by evidence, and is contrary to the opinion of some of those who examined into the facts of the outbreak on the spot. When he adds that "the Thames and " the Lea destroyed their thousands under similar circum-" stances," he states as a fact that which is mere conjecture, and, in the case of the East London water, conjecture for which there is but the smallest foundation. When Sir William Jenner improves upon this statement, and broadly asserts that " a large proportion of those who died at the east of London from " cholera were as certainly killed by the water they drank, " as if the water supplied to them had been contaminated " with arsenic," we are inclined to ask him whether he belongs " to that *very small section of the medical profession* that de-" sired to place their knowledge on a sure foundation," as Professor H. Bennett felt it necessary to tell his professional brethren he did himself. These loud assertions of guesses for facts only do harm to the cause they are intended to promote. And they do worse—they stop inquiry. The many who do not "desire to place their knowledge on a sure foundation" accept them at once as truths, and an unsupported dogma becomes an article of faith. There is really no more *proof* that cholera is disseminated by drinking water contaminated with choleraic stools, than that diabetes is produced by drinking water contaminated with diabetic urine. The germs, the fungi, the cells, or whatever is supposed to propagate the disease, are only imaginary existences. The chemist cannot find them, the microscopist looks for them in vain, and "the " physiologist only detects them by their effects;" or it would be more correct to say, only guesses their existence as a probable explanation of certain facts. What we know of a certainty regarding cholera is, that its home is in the East, and that its course here can always be clearly tracked. But when it has arrived here, all we know about it may be summed up in the words applied by a contemporary last week to the grouse disease—viz., that "it is terribly fatal in its attacks, " and strangely capricious in its visitations." It may, perhaps, eventually be proved that water is in some way concerned with the propagation of cholera; but all we know to-day is, that towns furnished with pure soft water have suffered from cholera, and that towns supplied with water from rivers into which large quantities of cholera evacuations are known to have been admitted have never had a case of the disease. We know also that in Holland cholera was nearly as fatal among those who drank rain water, as among those who drank *polder water*, or water from the low-lying canals which receive the drainage of the country. In fact, if we consider the propagation of cholera only in connexion with water supply, the data are so contradictory that no unprejudiced mind would think of drawing any general conclusion at all from them.

The letter of Dr. Frankland in defence of the term "im-" purities" as applied to the saline ingredients in water, and of his views on "previous sewage contamination," cannot be passed over without some notice. The term "impurities," the Registrar-General informs us, was first applied to these matters by Dr. R. D. Thompson, and it has been continued by Dr. Frankland, "both Fellows of the Royal Society." We have yet to learn that election to the Fellowship of the Royal Society confers infallibility; but we may let that pass, since many Fellows of the society object to the term as it is employed by Dr. Frankland. Chemically speaking, of course saline matters in water are impurities, just as ash in coal is an impurity; at all events, it must be admitted that the ash is utterly useless for all purposes to which coal is applied. But Nature never furnishes us with chemically pure water. It comes to us from the sources with certain dissolved ingredients, and to say that they are useless is to say more than Dr. Frankland knows for a fact. They may make water objectionable for manufacturing operations, while they may add to its value for drinking purposes. The Registrar-General's returns make it perfectly clear that towns supplied with hard water have a much lower rate of mortality than towns supplied with soft water, and, until a truer reason is shown, it is perfectly logical to connect the difference in the death-rate with the difference in the quality of the water supply. With regard to the question of "previous sewage contamination," Dr. Frankland's assertion is that, making allowance for what is contained in rain, the nitrates found in water prove the anterior pollution of that water by animal organic matters. He seems to consider nitrogenous vegetable matters of no moment as a source of nitrates, and says the amount of salts of ammonia used as manures—which are rapidly converted into nitrates—is so small as not to require consideration. Now, the quantity of ammoniacal salts and nitrate of soda used as manure on the lands which drain into the Thames and its tributaries is, perhaps, rather large, and as probably the greater part of the soluble manures find their way in time into the rivers, it is hardly safe to conclude that all the nitrates, except what might be found in the water as rain, must be of animal origin. Then we have the admission that "absence of nitrates is not " absolutely conclusive evidence of immunity from pollution;" and knowing that nitrates, if present, are perfectly innoxious, we are forced to the belief that it is of little consequence to us whether they are present or absent, for in neither case are we helped to any conclusion as regards the safety or danger of the water. As much may be said of nitrites and ammonia. These are not the matters in which danger resides, if danger there be in a water, and thus any calculation of the previous sewage contamination is practically valueless. Chemical ana-

lysis, Dr. Frankland admits, has failed to discover anything positively deleterious to health in Thames water, and also in the dejections of patients suffering from cholera or typhoid fever. But there are men, like Mr. Simon and Dr. Parkes, who tell us that these dejections are capable of communicating the diseases to those who drink water contaminated with them. On the other hand, Pettenhoffer, of Munich, a man of equal scientific repute, and who has investigated the subject with equal care and impartiality, has come to quite a different conclusion. Science, then, it would seem, can help us but little in the matter; but common sense tells us to preserve a drinking water from direct contamination by sewage. And if, at the same time, a perfect drainage be established, sewers be properly ventilated, and drains perfectly trapped, we expect to hear less and less of the spread of cholera and typhoid fever in our large towns.

SEWAGE.

The Coventry people, with the consent of Mr. Rawlinson, have decided to irrigate with their sewage, and are about to expend £23,388 in the purchase of land for the purpose. It is to be hoped that the Corporation were duly cautioned that an irrigation scheme, to be successful, need not be commercially remunerative. An experiment, however, on a small scale, on some low swampy land, is said to have raised the annual produce of the land at the rate of £10 per acre. With a rate of 2s. 6d. in the pound for general purposes, and 3s. 6d. for the poor, Coventry had need do something to make the most of its resources. It is to be noticed that the Corporation have obtained the consent of the Treasury to dispense with the repayment of the capital in thirty years. If the scheme should prove commercially successful, other towns will not be slow in applying for the same permission, and a farm will be a common adjunct to a Corporation.

But already we read complaints of the difficulty of disposing of sewage grass in the green state; and a necessary accompaniment to a sewage farm will be a kiln for making hay the greater part of the year.

The inquiry into the condition of the Thames at Barking ended on Saturday week. From the closing addresses of Sir J. Karslake and Mr. H. Lloyd, it might be gathered that the inquiry was promoted not to compel the Board of Works to take the sewage out to sea, but to convince the Board of the advisability of their becoming partners with the Essex Reclamation Company in a scheme for utilizing the sewage nearer London than the Maplin Sands, the idea of reclaiming which would seem to be altogether abandoned. Mr. Rawlinson promised that his report would be short, and soon presented.

With all our difficulties in the old country, it is interesting to read that the inhabitants of Melbourne are beginning to cry out about the condition of the Yarra from pollution by sewage.

Circular to Gas Companies.

Our prediction that the gas filibusters would be on the alert at this season to attack unprotected gas undertakings was not premature. A well-known gas agitator has already made descents on two important towns in which gas is manufactured and supplied by private individuals, and he has contrived to obtain the support of some members of the Local Boards. At each of those towns meetings have been held to hear him expound the principles on which gas might be, theoretically, manufactured and sold at 4s. or 3s. 6d. per 1000; and as the prices charged have been hitherto 5s. and 5s. 6d. per 1000, it was not difficult to show that, assuming the calculations to be correct, there ought to be a great reduction. Neither was it difficult to cite numerous instances of lower prices than 3s. 6d. in various parts of the kingdom; and in this manner a strong case was got up in favour of purchasing the existing gas-works by the Local Boards, or of forming competing companies. It was curious to observe how, in the course of the renewed agitation, poor Mr. Flintoff was contemptuously thrown overboard by his former colleagues, who joined together in heartily laughing at the mention of "the eminent Mr. George Flintoff, "of London." Why he should be thus treated we cannot tell, further than that those who used to pull together in the same boat, seem now inclined to compete for employment or to thwart each other's progress. In both towns to which we have alluded, the proprietors of the gas-works have expressed their willingness to sell; but an amicable arrangement of that kind would scarcely meet the views with which the agitation was promoted, and a forced sale to a competing company applying for parliamentary powers would be greatly to the disadvantage of the owners of the gas undertakings. Whether the parties attacked will have courage to meet their assailants by applying themselves for parliamentary powers, remains to be seen. They have timely warning, and, if they take advantage of it, they have nothing to fear.

The grand experiment in public lighting, boastfully conducted by the surveyor of the Leamington Local Board, has wofully failed to realize the expectations he raised of the important advantages to result from it. Honour to whom honour is due—and if there be one thing more than another for which Mr. Hughes may claim celebrity, it is the invention of the double-tap—but that honour, such as it is, the surveyor of the Leamington Local Board would snatch from him. Last year he widely announced himself as the inventor, calling it "a "new system which secures a very superior light, while it "effects a very important saving of expense." The "new "system" has been in operation in Leamington upwards of two years, and, according to the surveyor's report, presented at the last meeting of the Local Board, there has been a total saving, in nine quarters, on the number of lamps of £714, though the actual cost of lighting the town has increased. The result of the experiment, as stated in the *Leamington Courier*, is, that "the town is infinitely "worse lighted than it was prior to the introduction of the "double-tap, and the cost to the town has been increased. . . "The puffed-up new scheme leaves the town in darkness half "the night, or, at least, in that doubtful state when there is "just enough light to make darkness visible." It could scarcely be otherwise, for the taps are adjusted to consume one-fifth less gas than formerly. The Local Board have also tried the experiment of taking the lighting and extinguishing of the public lamps in their own hands, being persuaded that they could do the work more economically than the gas company, but with no better success; for, after having purchased the lanterns and pillars, they have to pay as much per lamp for lighting and extinguishing as they were charged by the company. Even the chairman of the Gas Committee admitted that his expectations of saving in that respect had been disappointed.

There has been an animated discussion in the Salford Town Council on the subject of a renewal of the tar contract, the Gas Committee having narrowly escaped a vote of censure for renewing a contract for the sale of tar and ammoniacal liquor supposed to be unfavourable. The prices for three years are—for tar, 19s. 6d. per ton; for ammoniacal liquor, 6¼d. per 100 gallons, not exceeding 6 degrees. It was alleged by the chairman of the Gas Committee, in vindication of the contract, that the value of aniline dyes had been depreciated, that no new means of applying coal tar had been discovered, and that the price was quite as much as, under the circumstances, could be expected. It was contended, however, by the objectors to the contract, that much higher prices had been obtained in other towns, and that coal tar and ammoniacal liquor were increasing in value. In support of that opinion it was mentioned that at Altrincham there had been an advance of 75 per cent.; that at Blackburn the new contract was 28s. per ton; that the Hyde Chemical Company stated tar was worth to them 30s. per ton at a distance of four miles from their works; and that the price obtained by some of the London gas companies was 30s. per ton. The proposed vote of censure on the Gas Committee was ultimately withdrawn, the intended object, that of giving publicity to the terms of the contract, having been gained.

It is reported that one of the collectors of the Commercial Gas Company has absconded, carrying with him upwards of £1000, collected within the ten days preceding his flight. The frequency of such frauds is calculated to injure the value of gas property, and shows the necessity of more stringent control over the collectors. We have not heard the particulars of this last robbery, nor whether, as in the case of Higgs, there had been any ground previously for suspecting his honesty. There seems to be no reason why gas companies should be peculiarly liable to be so defrauded, unless it be that the extraordinary success of Higgs may induce others to follow his example. A daily payment of the money received appears to be the most effectual preventive, accompanied by a

vigilant inspection of the books, to ascertain whether the average amount has been collected. Were such a plan adopted, the defalcations could not exceed a few hundreds of pounds, instead of amounting to thousands, and the mania for fraud would be effectually restrained. Of Higgs nothing has been heard. Having failed to surrender to the Bankruptcy Court, and he has been declared an outlaw.

The liquidators of the County and General Gas Company, Limited, have declared a dividend of 10s. in the pound on the debts proved, and, as there is still some property to realize, it is possible the debts may ultimately be paid in full. We believe, however, that there is very little chance of the shareholders receiving anything.

The question of the removal of the gas-works at Southport is not yet decided, a medium course having been proposed. Instead of enlarging and remodelling the present works, it is suggested that the most judicious plan would be to erect all the additional works required in some more suitable situation outside the town, on the understanding that the present works should be continued in use, without being extended, until worn out. This plan was proposed at a recent meeting of ratepayers, at which strong objections were urged to the expenditure of large sums of money on the existing works, which would increase and tend to perpetuate the alleged nuisance of having gas-works in the centre of the town. After a long discussion the subject was adjourned for further consideration.

America is no more free from gas agitators and quacks than London. Since 1861 an Act has been in force in the State of Massachusetts, which provided for the inspection of meters and the occasional examination of gas by a state inspector, and made gas "non-merchantable" which has a minimum illuminating power of less than 12 candles *tested with the burner, and under the pressure best adapted to it.* A Mr. N. C. Nash has this year proposed another Act, authorizing the appointment of inspectors of gas and meters in all cities and towns of the Commonwealth, and directing the daily examination of the quality and purity of the gas. It also enacts that gas shall not be merchantable under an illuminating power of 16 candles, and directs it to be tested by the Birmingham burner. This Act was opposed on two grounds—first, that American coals will not yield 16-candle gas at all times of the year; and, secondly, that the Birmingham burner is not adapted for testing such gas. The committee of the State Senate to which the Bill was referred submitted a series of questions to Professors Silliman, Storer, Wurtz, and Mr. Callender, who agreed that the Birmingham burner is not adapted for testing 16-candle gas, and that at present it would be impossible to secure a skilful examination throughout the state. We read that the Act passed the House of Representatives by a large majority, it being considered "a most exquisite joke upon the ob- "noxious gas companies;" but it was, we believe, rejected by the Senate. We should explain, perhaps, that when the illuminating power of the gas is below the legal standard, and therefore "not merchantable," the consumer cannot be compelled to pay for it. This is an ingenious way of fining gas companies, but the law must be difficult to apply.

Correspondence.

DEVONPORT GAS COMPANY.

SIR,—The comments on the accounts of this company, contained in your "Circular to Gas Companies" in the last number of the JOURNAL, were written apparently in haste, under a misconception of the facts, which a more careful perusal of the annual report and published statement of accounts might have obviated. The amount written off by this company, during 25 years, to depreciation of plant and works, averages 1¼ per cent. per annum on the paid-up capital, and the directors have very good authority for the course adopted. As regards the principle involved, Mr. Hawksley and other eminent gas engineers are, I believe, agreed, the only question being one of degree; some contending that not less than 3 per cent. per annum should be written off the value of the gasholders, purifiers, and the more perishable portions of a gas-work. The appropriation of surplus profits to a depreciation-fund is, in fact, acted on by the best-regulated gas companies, and the justice as well as policy of this course is confirmed no less by experience than by common sense. As a rule, it may be safely affirmed that very little of the original plant of a gas-work is in existence at the end of 30 years.

The Plymouth Gas Company, to which you refer, has appropriated out of profits, in the same manner, more than double the amount written off to depreciation by this company, and, in addition, they have formed a reserve-fund of £7500, which the Devonport Gas Company have not yet been enabled to accomplish. The circumstances of the two gas companies are, indeed, widely different. The borough of Devonport comprises 50 miles of streets and roads, over the larger portion of which the mains of the Devonport Gas Company extend, with an annual *private* consumption of 44 million cubic feet of gas, or about 1 million cubic feet per mile. The borough of Plymouth, with a more limited area, has a *private* consumption exceeding 4 million cubic feet per mile. Hence the difference in the price charged, and in the position of the two gas companies. In confirmation of this I cannot do better than quote your own words (*vide* JOURNAL OF GAS LIGHTING, Aug. 23, 1864):—

"Their case"—*i. e.*, the Plymouth Gas Company—"is indeed entirely exceptional, for though many companies can and do manufacture and distribute gas at as small a cost, no company, whether new or old, can, under ordinary circumstances, pay a reasonable dividend from the profits of gas supplied at the rates now charged at Plymouth."

I may be permitted to remark that the price charged for gas at Devonport is less than that charged by several of the metropolitan gas companies, although the delivery of gas in the metropolis is so much greater, and the supply more concentrated.

It remains yet to be proved whether, under equal conditions, 14-candle gas can be supplied at less than 3s. 9d. per 1000 feet.

Your assumption that "£350 of borrowed money has also been paid out of profits," in addition to the amount written off to depreciation, is altogether erroneous. Neither is it consistent with the facts that "dividends at the rate of 10 per cent. to the shareholders" have been paid by this company. The highest dividend paid has been 9 per cent. on the original shares, and 5 per cent. on the preference shares, being 1 per cent. below the maximum rate prescribed by the company's Act of Incorporation.

I leave you, therefore, to judge whether there exists any reasonable grounds for the action on the part of the gas consumers, suggested by you in your "Circular" of the 3rd inst.

At the same time, I wish it to be distinctly understood that the directors entertain no scruple as regards the setting in motion of the powers vested in the quarter sessions, or the appointment of independent auditors; on the contrary, they challenge the strictest scrutiny of their accounts.

As a public body, acting for the general weal, the directors are ever amenable to *fair* criticism. To our would-be critics, I would only say, "Nothing extenuate, nor set down aught in malice."

RICHARD CLARKSON SMITH, *Chairman.*

Devonport, Aug. 9, 1869.

[Our respected correspondent quite mistakes the object of our remarks upon the practice of the Devonport Gas Company, and other companies, in writing off a sum for depreciation in reduction of the expenditure on works, where no special authority is given for that practice in the Act incorporating the company. It is no answer to our objections to say that common sense encourages such a course, if the practice is illegal, as we apprehend it is in all cases where the shareholders have received in full their prescribed dividends. In the Devonport case, the proper course would have been to pay the back dividends when the reserved fund was full, and let the property stand in the books of the company at its full cost, leaving the reserve-fund to be called upon to renew and make good all dilapidations as they arose.—ED. J. G. L.]

Legal Intelligence.

DUNDEE GAS ARBITRATION.

(*Before* HENRY HAWKINS, *Esq., Q.C., and* THOMAS HAWKSLEY, *Esq., C.E., Arbitrators; and* G. POWNALL, *Esq., Umpire.*)

(*Continued from page* 623.)

THIRTEENTH DAY—WEDNESDAY, JUNE 9.

Mr. DAVISON proceeded to address the arbitrators on behalf of the company. He said their Act was an Act of 1830. They had certain capital in 1250 shares. They had a reserve-fund of £15,000, and what was very important, they were utterly unlimited in dividend, and there was no control whatever over them respecting amalgamation. What they had to do was to supply the Dundee consumers in their district with gas, equal in quality with the seven largest towns in Scotland, and at an average price with those towns. No attempt had been made by the other side to show that those conditions were not complied with. The company had charged a price, without their discounts, which was not above the average of those seven towns. He did not think that the question of the amount of capital was any question in arriving at the value of a concern of this sort. The reason he thought it necessary to bring forward the accounts spread over the whole time was, inasmuch as the capital, to begin with, was small; and the earnings unquestionably, he freely admitted, in the year 1868, the first year of Mr. Macrae's management, looked large in comparison with what had been done before, though borne out by what had been done for the commissioners. He thought it his duty to show that the company, rather than they would go on dividing comfortable dividends, and go to Parliament for fresh capital, they went on spending money which they could have divided on capital, and a sum of £80,000 to £100,000, including the increased value of the land upon which the buildings proper were placed, had actually gone out of that which might have been divided amongst the shareholders, spread over this number of years. In 1846 the new company started, and from 1850 downwards it was obvious that the

two companies were in unison; they worked in harmony, and at the time this agreement was made to take over the works, were actually under the control of one manager as now. In 1867 both companies came to Parliament for money and for amalgamation, and were opposed by the corporation. It seemed clear that, as far as the money bill was concerned, the corporation withdrew their opposition, and then the amalgamation bill was withdrawn. The result was the agreement scheduled in the Act of 1868, upon which the arbitrators were to act to-day. The agreement made was with the corporation, not with the commissioners, who had nothing but that rate in aid. Now, what they had to arrive at was the annuities on the amount of the share capital. In estimating the value, it appeared to him that what ought to be arrived at was not the net value either to the company or to the commissioners, but the net value of the undertaking as a going concern. He thought the value ought not to be arrived at as if the works were being taken compulsorily. The question must occur, how could they be taken as compulsory when there was an agreement? This must be a case for compensation in the fullest sense. His learned friend, Mr. Lloyd, in the Glasgow water case in 1856, said that compensation meant granting an equivalent. He said: "It assumes that the state of things has been disturbed, and it is a readjustment of the state so disturbed. . . When we come to a concern like this, which has no market price, there are circumstances affecting the value which cannot be appreciated without careful examination and deliberate and well-weighed judgment. Our case is that the compensation must be based on our actual net earnings at the time when we were taken over." The amount of capital was not the way of arriving at it, and structural value had nothing to do with it, except for the purpose of seeing whether the value of the thing was as good as new, and fit for carrying on the business as the company carried it on. The way to do it was to arrive at so many years purchase of the net revenue of the undertaking, *plus* the extra capacity, if there was any, and *minus* the depreciation or deterioration. It appeared to him, with respect to the number of years purchase, that it ought to be the very largest number of years that ever was known, for the reason that the company were unlimited in their dividend. Mr. Barlow, Mr. Haywood, and Mr. Lee, one and all on both sides (with Mr. Stevenson's exception) put it at 20 years; but Mr. Barlow said he had known it valued as high as 22 years.

Mr. LLOYD: And as low as 15.

Mr. DAVISON said he did not doubt it. He quite admitted that might be the case of a person carrying on a gas undertaking without statutory power, and it might be with a rival in the same town who had a statute. Could there be a case where it ought to be higher than the present? He did not shut from his mind that they might be subject to the competition of a third company, but subject to that they had power to go on dividing anything that they could make subject to the provisions of the Act. It was all very well talking about what the public would bear, when the public had borne over a series of years 6s. and 5s. 6d., and he could not help thinking that even at 5s. 2d. or 5s. 4d. they were not very badly used when they got 26-candle gas. He would now come to a letter written, which was embodied in a clause in the Act, of 1868, which stated that any changes in the clauses in the companies bills then pending in Parliament, relating to the quality and price of gas which had been made after March 8, 1867, when the agreement for the sale of the companies undertakings was entered into, should not affect the ascertainment of the price or annuities to be paid by the magistrates and Town Council for the undertakings. Now, having put that case of the proposition, which was the usual thing now-a-days, of lowering the price and raising the quality, was it to be contended for a moment that as they had taken that hard and fast line on the state of legislation on a particular day, the companies were not to have the advantage of it? That bill, sworn to and admitted by the other side, showed, if it had received sanction, the companies were to have supplied 14-candle gas. The company were entitled, he might say, to the whole thing; that it ought to be valued at what they would get in Dundee under Hume's clause—the average price of the seven towns for 14-candle gas—because that bill destroyed the clamour about the illuminating power, and the price was left untouched. It worked out, he thought, at £4000 or £5000 a year. His learned friend would certainly not suffer any very great inconvenience from that, if he only added it to that which his people had brought the figure down to which the company was to receive. The question arose, what was the sort of evidence, and the mode by which the net value of this undertaking could be arrived at on a given day? It did not appear to him that there was any particular period to which they ought to be bound to look more than to another. In his humble opinion they ought to look at any given year, if they could find one, which they thought was a fair test of the capacity of the works. It was proved to demonstration, by the 5½ months Mr. Macrae had been working for the commissioners, that that, and no other, was the way in which the works ought to be conducted, and was a fair test of their capacity. The speech Mr. Macrae wrote to Mr. Harris was the most delightful thing that anybody ever saw. It was his (Mr. Davison's) case, because Mr. Spice and every one of the company's witnesses had said the same thing, and, in fact, they themselves had said it, because there was not one of them that did not take Mr. Guild's rectified balance-sheet. Why did they take £9740? It was a great deal too low. Why? Because chemicals were lower in that year than ever was known; wages were higher, and the prices of coals also. And that was Mr. Macrae's speech to the shareholders. No one of his (Mr. Davison's) witnesses had ventured to look to the future, which they might have done if they had wished to exaggerate their claims. Why should there be capital found for the commissioners? They had never had any money at all to borrow; they had always had some in hand. The company always had money borrowed, because, until they got that bill with the £50,000, they necessarily had money expended on the works which they could not get except by taking further sums out of their dividends, which probably they thought were low enough. His learned friend would not call that working capital, because, he said, if it was it would be ridiculous. His learned friend was good enough to say that the company did borrow from their bankers. If they did, and if that was working capital, then it was all deducted before they arrived at the net, and therefore they must not take it off again. The arbitrators had not to deal with the hypothetical tenant so often heard of at sessions in rating cases. They had to deal with the value of the thing to be transferred. Now, respecting the directors fees, that again introduced the question whether it was to be valued for the company, for the commissioners witnesses on the other side, had one and all, except Mr. Haywood, forgotten the directors. Surely the £284 for directors ought not to come off unless they were satisfied on evidence that there was something which they did which somebody else would be required to do. Mr. Jamieson had an item of £500, as the sum to be taken for the effect of competition. No other human being had ever spoken of it, and Mr. Barlow, the only gentleman in this case who had had experience on the question, allowed nothing for either past, present, or future competition. Upon Mr. Jamieson's valuation, the gentlemen who invested their money for a period of 39 years, and who had been entitled to more than 10 per cent., were now entitled to the modest sum of 5 per cent. As to the retorts, it was also clear that the number in use was 102, and not 108, because Mr. Macrae had explained that the other six were brought in for a special purpose. Whether right or wrong, something like £13,000 or £14,000 was the total arrived at. If the working of the 5½ months *plus* Mr. Jamieson's own estimate of the 6½ months, worked out the same figure put by the company, were not these facts better than half a hundred of people who were called to give their opinion, who talked about coal being too dear, or gas too cheap? In reference to another matter which appeared to be, he regretted to say, a sample of their unfairness in these valuations—he meant double depreciation—he could not understand a depreciation in the present and one in the future also. What he understood was that they had to get at these works, plant, and structure, to make them as good as new, and if they arrived at the sum which would put them in that position, then the people who were to take them would have to work them, and, of course, to take out of their own profit something which would keep the thing going on. But they were not, having put them in that position, to take them out again, as these people seemed to have done. It seemed odd that not one of the gentlemen had presented a report of his own. They had not even dealt with the books themselves, but had one and all started with the £9740 supplied by Mr. Guild. They had not got Mr. Guild's figure until that gentleman was called into the room. Who was it valued and advised them? Not one of them had put forward an independent report, and he ventured to think that somebody else must have been there who was not called. In reference to the coal, it was true that there was a certain quantity which was taken over by the commissioners, that the company contracted for a certain quantity which they had not got rid of, but it was quite clear that it was such a quantity as, in the course of the next few months, would be disposed of; and he could not help thinking, taking £11,744 as representing the cost of coal for the 5½ months, that it was unfair, in arriving at the estimate for the 6½ months, to put the whole of that for that period. It was not fair to take an arbitrary figure, as Mr. Jamieson had done, of 21s., which was the difference between his £8038 and the company's £7122 for the 6½ months, which was the same quantity of coal that was the residue of the coal required, taken at the calculation of Mr. Jamieson himself, checked by Mr. Macrae, with the difference that he did not do the figures himself. That ought to have been taken at 18s. 5d. or 18s. 8d. The same price as for the 5½ months was actually done. They said, on the other hand, the company ought to have imagined a rise of 3s. a ton. That seemed to be most unfair, but that was the way in which the difference arose. Referring to the surplus land, the learned counsel said that in Dundee and everywhere else the Police Commissioners, like the Highway Board, did that which was good for the town. If they did not get that 6d. a ton out of the tramway, they would have to pay it for the gas in the shape of so much per 1000 feet. It was not to be borne for a moment that, if the tramway was to be taken up, the company were not to have the value of the land on which the tramway was. The learned counsel proceeded to remark on the evidence brought forward, and to discuss the case at great length, and concluded by remarking that the property was proved to be exceedingly valuable; and as for the ridiculous valuation of Mr. Jamieson, who would give those old shareholders 5 per cent. only upon that which they had been working up and adding to, to the extent of £100,000—he thought even admitted by him to the extent of £83,000 out of the revenue gone to capital—he ventured to think that they would not listen for a moment to such a suggestion as that, but would see that that was a figure unsafe to take. And if they destroyed that they destroyed the whole of the rest, till they came up to Mr. Stevenson's estimate, which seemed to be the nearest approach to that which was the estimate of those gentlemen. With the best possible thanks to each of the arbitrators, he hoped they would come to a conclusion in the matter, and that his clients would be satisfied with his exertions on their behalf.

Mr. LLOYD then addressed the arbitrators on behalf of the commissioners. He said the difference between his friend's clients and his own was no less a sum than £10,000 of annuity, representing, according to his view, £250,000. The question of value to be ascertained was not the value to the purchasers; circumstances might change, and conditions might occur which might render that which was ever an unprofitable thing in the hands of one party an exceedingly profitable one in the hands of another to whom it was transferred, and he had never yet heard anybody who had the courage to state that the arbitrators were to calculate the amount of value as it might be and would be probably in the hands of another proprietor. He did not shrink, therefore, from saying that they were to look to what this thing was capable of producing to the company, rightly managed, and giving it the full productive power which it had, and the full and ample result from it. He denied altogether that this was a compulsory sale and a forced operation, and all his friend's arguments tended to show it was the best thing the company could have done for themselves, and that with both hands they should have accepted this proposal to purchase them at an arbitration price. The rival gas company, which started in 1843, caused a competition, and the effect of that competition was not only a reduction of price, but a reduction of profits, dividends, and the price of the shares. They went on working in that state, were actually brought to the verge of bankruptcy, and only gave a dividend almost by accident, or by manipulation of their accounts and the like. Then they found they could not go on, so, in spite of the clause prohibiting amalgamation, they made a secret arrangement with the other company. That was originally entered into in 1855, when they had had some considerable experience of a ruinous competition going on between them. They went to Parliament for an amalgamation bill. They were coerced to do so by their own necessities, and not by the corporation. The latter, seeing the consequences of that, proposed to oppose, and the result was the agreement of March, 1868, upon which they were sitting now. In the meantime the company stated that they were in a bad financial position, and had borrowed £20,000 in excess of their powers. Either they must have taken that amount out of their revenue to pay that debt, or they must have got a power to create capital representing it in shares. Therefore they were to go to Parliament for a money bill, and so was the other company, but they said, as a part of their bargain, "If we are going to Parliament to make our financial position right, it is as broad as it is long. If we have the means of paying these debts, it is so much the better for you; therefore do not oppose our money bills under that arrangement." He had not seen much more cunning displayed than that. They cleverly introduced into each of those money bills a clause reducing the illuminating power to 14 candles. Did anybody on earth believe that, if 14-candle gas was to be their maximum, the price of gas could have been kept at what they were putting it at? It was utterly beside the question, and was an attempt to introduce £5000 a year, without a shadow of foundation on which to rest

it. In regard to valuation, land, with whatever structure was on it, was of a particular value for all time; they had no right to add to the permanent value of the land the particular increased temporary value which trade gave to it. He admitted, on the other side, that the capitalization was to be at 20 years purchase. He agreed that it did not matter which year was taken as the test, but in this case it was perfectly clear that the year selected was not an unfavourable one, as had been suggested by the company, because, if they looked at their history, they would find that it was an extraordinary fact that their revenue had jumped up from £4000 to £9740. It was a startling fact. It was possible, but it was singular that it should happen to begin and to go on just from the time when an agreement had been made for the purchase by another body; and no man living would say that, taking that average, it was reasonable to suppose that it would jump up so suddenly unless there were some extraordinary circumstances to account for it. In the year 1864-65 the net profit upon the working was 1s. 9·91d. per 1000 feet sold, and in 1867-68 under Mr. Macrae's prodigious management, it was 1s. 9·36d. per 1000. What was the use of talking of superior management with that fact staring them in the face? It was true that in the two intervening years the profits went down. But why? Because the price of coal fell suddenly and rapidly down, and they did not at once raise the price of gas, but they raised it pretty smartly when the agreement began to tell. Moreover in the latter year nothing was brought into account of the revenue of the company for meter-rents, and if that had been added, it would have made a balance against the year 1868; it would have been 2·45d. against the 1s. 9·36d. Those facts and figure were inexorable, and showed that was not the way of accounting for the difference between the two. What was it then due to? The price rose in 1867 from 4s. 8d. to 5s. 2d., and in the subsequent year to 5s. 4d. The great difference was in the price charged, and in the saving in the price of coal. Mr. Macrae had since been ordered by the commissioners to raise his illuminating power, and that he could only do by using coal which averaged 21s. per ton. When the difference between the company's actual divisible revenue in one year before the agreement and the year they were now taking was looked at, they would find a striking difference, for from the time this agreement was entered into, the company deliberately set itself to work to increase as much as possible the apparent revenue, and to diminish that which was to go against it. They altered their system of accounts; although they brought into revenue what was charged as meter-rents, they put nothing against it for depreciation. Supposing they had been carrying on the works themselves, would they not, as men of business, have done so? The life of a meter was 15 years, and assuming there to be 15,000 meters at £1 each, it was quite clear there must be £1000 a year to replace them. The next thing they did was to avoid placing to account that which they had been in the habit of doing before—viz., carrying to an accumulation-fund a certain amount which they were bound by their Act to do. They were bound to accumulate up to £5000 as a reserve-fund, but they only got up to between £3000 and £4000, then they suddenly ceased, and carried no more to account. Then as to repairs and renewals, although they had been charging a certain sum which could be ascertained in an average, they then confined themselves to mere repairs, and they took good care that the repairs done in the year which they chose to take as their test year should be the very lowest possible that could be done for the purpose of keeping up at all the efficiency of their works. They were lower than they had been for three years previously. They adopted the same principle with the service-pipes and bad debt accounts. Then, again, in "General expenses," they had reduced that to a very small amount in comparison with previous years, and there again they swelled the amount of net revenue by diminishing the charges. Then there was the fact that they actually placed Mr. Macrae upon a higher salary, dating it back from the time he had been in their service, and putting down in their accounts less by £78 than they ought to have done. The aggregate came to a considerable amount. As to the company saying they had taken an unfavourable year against themselves, because coals and wages were high, and manufactures depressed, Dundee was not an exception to any other trading town—they rose and fell. The depression was simply a reaction from an exceedingly inflated state. During the cotton famine Dundee prospered when Manchester suffered; they were not going from a year normally good to a year exceptionally bad, it was merely returning to the normal state of things. They had their seven years advantage of that, and the result of that was shown in their tabulated revenue, and yet it had never enabled them to divide, in the shape of share capital and interest, more than £4500. [The learned counsel here quoted evidence, at some length, in support of his statements.] In reference to the tramway, it was notorious to all that Dock Street, across which the railway crossing was made, was becoming an increasingly important thoroughfare; the Harbour Trustees were most earnest about keeping those arteries clear, and it was as probable as not that any time within a month the tramway might be taken up. It was quite clear that if that was an uncertain useful thing, and probably would be discontinued, the 6d. per ton upon the amount of tons brought in should come off. There was not only the coals brought in this way, but the lime and residual products went out the same way; and therefore, when it was estimated for coals only, it was under estimated. Then as to rating, the company had been assessed on £1800 or £1900. It ought, at least, to have been on £2180. Although that had not been actually charged, Mr. Blackadder gave very good reason for it. They grumbled even when they were assessed at £2100 and £2600, and endeavoured to get rid of that increase until this change took place, and it became necessary to show that they were making a large profit; then they insisted upon being assessed at £6000 a year. Then came the very important item of 1 per cent. upon the net gas-rental for "Risks and casualties." His learned friend had asked if any evidence could be given of anything of this kind ever happening in Dundee. However, it was quite clear that all prudent persons would set aside a fund for that purpose, and the commissioners were entitled to make it a charge against the property. The next thing was an insurance of 10s. per cent. upon the £25,000, that was the ordinary perishable matter; that was £125. And then came the interest on floating capital, which was put down at £500. Rents were collected from the poor tenants quarterly; from the chief and principal tenants three times a year. There was no doubt that while that was outstanding there must be a certain sum of money to carry the thing on, and the commissioners themselves had bought stores from the works to the extent of £2500; and taking the uncollected amount now outstanding it would make £10,000 of working capital. Was it fair to take interest at all on that? It had been the universal practice, it was the difference between profit in trade and profit accruing in the use of money in any other way, and upon that subject, therefore, he thought they might fairly take Mr. Barlow's £500. Mr. Barlow sought to add the renewal of 1 per cent. on the estimated depreciation of the buildings, plant, &c. That was £733. There was no doubt that that was to represent the back depreciation. There must have been, and might always be, kept properly a fund which was to keep the thing in good workable condition. The question, if any, would arise as to the subsequent item of depreciation in the gross, which is taken off the whole. The works and plant must be kept up in a state to allow of earning the revenue, and he thought they must accept this for a thing that must be a charge against the revenue of the concern. He had put the works themselves, property so let with the mains, and all those adjuncts, at 1 per cent. upon the £77,250, and that worked out the £733. Those were all at present which Mr. Barlow had sought to add as charges to the amount given by Mr. Spice and the others, and that brought down the £9740 to £5952 at present.

Fourteenth Day—Thursday, June 10.

The Umpire inquired what were the numbers of each size of the consumers meters in use on the day of the transfer, the present net cost of each size, and whether they were iron or tin cased.

Mr. Davison said he would look into it.

Mr. Pownall asked if any arrangement had been come to as to enlarging the time of the reference affecting the new works.

Mr. Shiell said the new company were quite willing to consent, if the other party consented also, to prolong the time, or to go on immediately if they would not consent.

Mr. Pownall said going on immediately was quite impossible unless new arbitrators were appointed. He proposed to be at Dundee on Friday, June 25, at the works.

Mr. Lloyd then proceeded with his address. His friend, Mr. Davison, had twitted him with having accepted the £9740 as the *datum à quo* from which to start, and said, "You would not have done that had it not been an exceedingly favourable year for you;" and he put the difference in the price of coal, and the wages, and the like. But he forgot to state that what made it so unfavourable to the commissioners and so favourable to the company was the exceptionally high price of gas during that year. It was a difference between the 4s. 8d. practically charged before and the 5s. 4d., which made an enormous difference. Regarding the item for "Directors," that was a sum which clearly ought to have been taken into account as a charge against the company. It was certainly not a matter that people would undertake gratuitously. The company certainly could not have gone on without such a body, and, if this £284 was paid, there did not seem a shadow of a reason why it should not have been a charge against the undertaking—one which must have been a permanent charge. In respect of the surcharges of the expenditure upon the question of depreciation, the result of the differences between Mr. Barlow and Mr. Guild would be that, instead of £9740, it would become £6052 2s. 7d. Mr. Barlow took an interest of 5 per cent. on a capital of £10,000, and Mr. Spice upon £7000 only. Then there was £284 undercharged in respect of coals for the year, reducing Mr. Barlow's figure to £5752 2s. 7d. That being the result, he would now come to the additions to be made on the one side and the other. There was, firstly, that increment which Mr. Spice put at £730 in respect of the increased consumption to make the accounts up to November 11, 1868, instead of dating from May 31, 1868. There was no evidence whatever of any actual increase, and it was merely a supposition altogether; and on that ground, and also on the ground that if there was any increase, it was fully provided for in the 20 years purchase, he (Mr. Lloyd) ignored that item altogether. Then as to the surplus retort power, Mr. Barlow's figure worked out £1177 against Mr. Spice's £1755. Mr. Barlow took the land on which the retorts stood at 15s. a pole, working out £750, and added it. Then as to the surplus storeage power respecting the gasholders and tanks, there was considerable discrepancy, Mr. Spice taking 400,000 cubic feet and Mr. Barlow 135,000 cubic feet. The total capacity of the gasholders was 922,000 feet, and it was proved the greatest amount of gas required to be produced on the worst day was 780,000 feet, therefore it left a surplus of 142,000 feet as against Mr. Spice's 400,000 feet. An abatement of 7000 feet was made by Mr. Barlow, because the storeage could not be used at the time most required—viz., after sunset—because of the inlet and outlet pipes in some of the gasholders being too small. Taking 135,000 feet as half the contents of one gasholder (the last one erected), Mr. Barlow put it at £3858, as representing 135,000 feet extra storeage. Then as to surplus land, why on earth, if the company could sell it at £3 a pole, and it was not wanted for the works, had they not done so? Either it was a requisite part of their works, or they had been fools enough to keep out of the shareholders pockets so much as they could have sold it at. Mr. Macrae said positively that he could not dispense with any of that ground, as it was necessary for carrying on the works. It did not matter whether the thing they laid upon that ground would go to capital or revenue account; whether they stacked coals or pipes, still they must always have some ground whereon to put that which must be required in the progress of the works, and if they had not that they would have to rent land. Mr. Spice put £2133 as the saving in coals in the current year. He stated that sum was earned at a time when coals were exceptionally high, and there was no right to assume that that would continue; that a distinction must be made, because "practically," he said, "the price has been reduced by 5s., and though I do not take the whole of it, I have a right to take something of the difference between the exceptionally high price and the price now; if you had been working with such a price, the difference would have been £2133." But Mr. Spice surely knew that if they had had a lower price of coals they certainly could not have raised the price of gas, and it was a singular fact that as the price of coal rose so did the price of gas, and that the only justification for the companies in raising their price up to the extraordinary sum they had brought it to, so much beyond the rate they were working at before, was, that whereas they charged 4s. 8d. when the price of coal was low, they charged 5s. 4d. when the price was high; and it was clearly a monstrous thing to put the whole of that upon the commissioners, which was an exceptional abnormal price which they were to take as their base, giving the company the benefit of it, and then to cast upon them the difference in the price of coal, as if that lower price of coal would have continued. It was a piece with all the rest—"Swell it up as high as you possibly can on the one side, and reduce it on the other." Mr. Barlow was too right-minded to dream of such an addition as that, and therefore it went out. In reference to the leakage in that year, there was the fact that it was very little in excess of what it had been before, and when Mr. Barlow examined the meter the water-line was not accurate, and that would account for the little difference between the year preceding and the test year. But was it an abnormal quantity of leakage? Mr. Macrae said he did not believe he could ever bring it down to 20 per cent., and he could only get that by a very large expenditure in order to get rid of the causes to which it was attributable. There were different theories regarding the cause. It was said, at first, that the mains were in good condition; it was now admitted that they were not. If all the mains were stripped, as suggested by

Mr. Penny, to put them in a proper condition, the number of miles would startle the commissioners and ratepayers of Dundee. Then the service-pipes. The customers being very small consumers, the cost of maintaining those pipes was multiplied exceedingly, and if only £10ᵉ had been paid last year for repairs, that would account for a considerable amount of leakage there. Mr. Spice took off the depreciation at £950, which at 20 years was £19,000; whereas Mr. Barlow put it at £22,900, which was 1 per cent. upon the estimated value of that which was subject to that depreciation. It had been suggested by Mr. Hawksley whether they were not doing it twice. Of course, if it was wrong, Mr. Spice's admission would not make it right, and at first it might seem startling that the commissioners should say, "We must lay by 1 per cent. in respect of past depreciation, and consider that you have been putting that by every year, and now we have to take off from the price as new a further depreciation to bring them down to the condition of second hand." But the reason of that was known to every gas engineer. If a thing was sold at 20 years purchase, it was sold as new, and if it had gone down, they were to bring it back to new before they could put the 20 years purchase upon it; and these very commissioners, if they had hereafter to sell at 20 years purchase, would have to do the same thing, because no one would buy unless they did. Therefore it was quite clear it was the proper deduction to make. According to Mr. Barlow, after taking the 20 years purchase upon the net rental he had got, and adding those matters for surplus power, and deducting the depreciation, it left £103,909; but from that must be taken the £6000, which represented the £300 multiplied by 20, and that brought Mr. Barlow down, in fact, to £97,909, and that was really the state of the case. Mr. Church was the only witness on the other side who had the taste and honesty to put in the directors. Mr. Church began with their own account, as stated by them in the balance-sheet, and then added the interest; but in their balance-sheet they made out what they had paid, and they did pay, in fact, £552. But it now appeared a portion of that was for income-tax, and what they really did pay for rates and taxes was £461—Mr. Jamieson's figures, taken from the books themselves.

Mr. Hawksley asked whether there was any confusion in the different modes of dealing with the subject between income-tax and property-tax.

Mr. Lloyd said no, he had put it all out; it was only the income-tax that was deducted. Some of his witnesses had put less to the charges, and therefore swelled the revenue to a higher amount than Mr. Barlow had. And again, they had differed about the number of years purchase, and so on, and had fairly and honestly differed. [The learned counsel here referred to evidence at great length.] The total of Mr. Hughes's deduction amounted to £28,865, and that came to a gross profit of £6395 8s. That was very close, and was marked out by a totally different principle from other witnesses, because Mr. Hughes had nothing to do with the surplus value of the retorts and the land. He had estimated the whole, and producing the result, had taken it at 20 years purchase, and worked it out to £127,900. But inasmuch as that assumed, if it was taken at 20 years purchase, that it was to be had as new, he took the depreciation of £17,632 off; and with regard to the 4000 or 5000 meters that remained to be converted, to comply with the Sales of Gas Act, he put that at 10s. upon 5260 meters. That brought out a depreciation of £2630, which, added to the former amount, made £20,262 to be deducted from the £127,900, which left £107,638. He (Mr. Lloyd) was anxious that the arbitrators should see how, worked out by a different process, and one which would commend itself to any gas engineer, it came to the same practical result. Taking the annuity on that, it came to £4306. Mr. Ryde took the goodwill of the trade at £2500, being the net ascertained annual profit the worker was to make, at 6 years purchase. That gave £15,000. That figure 6 was an arbitrary one. The arbitrators were to judge whether 6 or 7 was the right figure. It was clear it could not be put as low as 2½; but it could not, on the other hand, be put as a certainty, but taken with a great degree of precariousness. There were many things which must occur. After making all those deductions, they did not know they would be able to carry the concern on successfully for any given number of years. Mr. Ryde also said that the goodwill must be supplemented by the value of the stock they would have to buy. He, therefore, put £17,000 for meters, and £500 for implements, and adding that £33,000 to his previous estimate of £54,000, it brought out £87,000. He said he knew nothing of surplus land, and if there was any he would not value it with the gas-works, but put £3000 for it. A careful valuation of the land, buildings, and plant had been made, and he (Mr. Lloyd) took that amount, less the depreciation, as his prime figure. That was his starting-point, and it had been allowed by Mr. Blackadder, Mr. Foulis, and other witnesses. £74,656 17s. 6d. was the amount, less the depreciation. If they added to that the difference between the meters in the companies books, and what it was put at—viz., £16,000—that gave £90,000. Or if they wrote off the value of the land as they had it in their books, it would give, less the £6000, £84,000 divided; that was giving them £10,000 in addition to what they had stated in the books as the present amount at which the meters stood. Then there was the accumulation-fund, and something for stores, and that would work out, as near as possible, to £87,500. There was a fact. The companies went for an amalgamation bill, and got a valuation carefully made according to their own statement by different persons, Mr. Paterson being the valuator, and it would be found that he brought it out £87,500. That was their own statement of the value of their own undertaking, including everything except what he (Mr. Lloyd) had previously referred to about the meters. That was the strongest confirmation they could possibly have of the value of the undertaking. [The learned counsel here proceeded to contrast the companies statement of their capital with the valuations of their witnesses.] The companies capital, as it appeared from their own accounts, was £79,000 odd. The estimated value of their works was £74,000, but of that share capital £50,000 was made up of the new capital, of which, upon statements and facts before the arbitrators, they had paid back to themselves the £14,000 odd which they said was surplus revenue before.

Mr. Davison: Which was due to revenue before.

Mr. Lloyd said that was just what he said. Their only plea and justification for that was, that there had been so much undivided before, and therefore they had a right to raise this capital and put it into their pocket. But what did the capital stand at? Not at the £79,000, but less the £14,000, therefore leaving that which was out at £65,000. That sum was all their share capital. And the commissioners were going to give them in respect of that (even taking it at £4500, which would be equivalent to an annuity on £120,000), very nearly double. But look at theirs—£350,000. He thought he (Mr. Lloyd) contrasted his figures very palpably with that. He got it that there was £74,456 1s. 3d. standing in the book as representing the value of their works, their account in their own book being that the capital was £79,706. They had actually appropriated to themselves out of that £50,000, £14,200; after paying all the debts there was £7500 divided as a bonus to shareholders in 1868, and £6700 remaining in the bank to be divided. If even the lowest valuation was taken at £14,000, the effect of that would be that they would have in secured annuity of 21½ per cent. of the actual amount of their capital, £65,000. They would have more than one-fifth of the whole of their capital in an annuity, and anything more preposterously absurd could not be conceived. If even £4500 were capitalized at 25 years purchase, it would be £112,500, and that would be a handsome thing upon £65,000. Taking it upon Mr. Barlow's valuation of £4156, they would get, turning it into an annuity, what would represent the dividend of 9 4-10ths per cent. on their capital. Taking Mr. Ryde's, it would represent 8 1-5th per cent. on their capital. Surely that would not be a bad thing for them. He (Mr. Lloyd) had to consider and to make out what the proper capitalization would be on the 4 per cent. annuity. He thought the balance of evidence was strongly in favour of that view, and the security which the Act gave to that would lead to the same conclusion. He could not conceive anything better secured. It was secured upon the whole of the gas-rental; by a rate in aid, if that rental failed; and, further again, by a summary process if that failed. It was a ludicrous thing to suppose that, because a further security was added in the shape of a receiver, or judicial factor, that it would weaken the security, and bring it down from first class to second class. The prices of such annuities quoted for the gas companies in Glasgow had been brought forward. Experienced witnesses had been called, who looked upon this as the best kind of security, and who stated that there was a difference between the rate of security in Scotland and England of a quarter per cent. In Scotland 4 per cent. could be got, and in England 4¼. The cases of the North-Western, the Great Northern, and the North-Eastern had been instanced, where the rate was 4 per cent. upon debenture stock, which could not be disputed. Those were cases where the money could not be got back, but the stock could be sold. Whatever capitalized amount he might find, taking it at 20 years or 16¾, whatever he might get, the net must come in that way to the capitalized amount, and was to be brought back after dividing by 25. He would now touch very gently upon the question of surplus land. He accepted as a fact that Mr. Pownall would go and judge for himself whether there was any surplus land or not.

Mr. Hawksley said he supposed, when Mr. Pownall had gone, in order to save time, expense, and trouble, he might as well extend his view to the works of the other company.

Mr. Shiell: Certainly.

Mr. Lloyd: I think the present impression is that that will be held in Dundee (still there is no objection to your doing it if you like) after our experience of the relative cost.

Mr. Pownall: Perhaps the decision in one case may save the necessity for another inquiry.

Mr. Lloyd said he hoped it might. His learned friends relied on a certain number of cases which seemed to justify the figure of £3 a pole on the surplus land. They came to nothing, as every case which they adduced was an exceptional one. There was not one which had anything like a parallelism with the one they were dealing with. There was nothing to contradict the reasonable evidence that 15s. a pole was a fair price. If it was worked out it would come to a far more considerable sum than any one would be willing to give for land close to a gas-work, only valuable as a part of the same, and not as land for building purposes. That really concluded what he had to say upon this either on one side or the other. With regard to the working of the concern in the commissioners hands, they decided to go on the footing upon which the works were handed over to them. They said: "We are bound by the Act of Parliament, if these annuities are not settled, to pay upon the actual dividend declared in the last year. We must take care to protect ourselves, and to do that we must continue charging the 5s. 4d. to make ourselves secure." He would now take the accounts, reminding them that for a part of the time it was fact, and for part it was estimate. In Dundee there were more dark hours in winter, and more light in summer than in London, and the difference, of course, must be proportionately greater. Taking that into account, the estimate made would err rather in favour of the company than of the commissioners. The result of that statement was a profit to the commissioners by combined working of £18,940 5s. 5d. Those were the estimates of the profits for the year of the working of the two concerns, and of that there was imputed to the old company £12,922 17s. 8d. The commissioners thought fit, rightly or wrongly (and certainly having called down upon their heads a great complaint and outcry from half the people in Dundee) to continue the price of 5s. 4d., and in the meantime they had got a reduction in the price of coal. Was it not manifest to every one present, in face of that reduction in coal, and other facts, that it would be impossible to keep up that price? The object of the transfer was to save the consumers from an excessive price of gas, to give them the best quality that could be got at the lowest price, and it was impossible they should continue that price. It was experimental and tentative. It was quite clear they would have to bring it down to the normal price, which was 4s. 8d. For every penny reduced in the price of gas there was £437 less income. If from £12,922 (the assumed profit of the old company) was taken off the difference between the 5s. 4d. and the 4s. 8d., it brought off a sum at once of £3583 4s. That would come inevitably, and it left £9339 13s. 8d. The commissioners at present had not allowed discounts, but would certainly be obliged to do so, because they could do no more than the company in the case of large consumers. There were deductions to make from the £9339 13s. 8d. to bring it to a comparison. Mr. Barlow's amounted to £1879 10s., bringing it to £7460 3s.; but the commissioners did it independently of those deductions. They charged nothing for repairs; they made no repairs at all, or so much less than what was fair they required must be put down for that £300, assigning as the reason that they wanted to spend as little as possible on the works, in order to see what was the highest rate that could be got out of it under the most extraordinary circumstances, so that they might see what they could do for the town. Then they got, by a mere piece of luck, an increased profit of £1000 upon their secondary products. That could not be taken as a certain thing. They were free from competition, they had nothing to fear, having both companies in their control; and if the fair results of what that competition would be were taken off, there would be a reduction of £500. That left it at £7660 3s. 8d. The other side said that they must be paid an annuity of £14,000 odd, and the proportion of the new company to the old, of about one-half—say, £21,000 of annuities. He had taken the profit at the highest, without making any of those deductions, at £18,940; and there was a discrepancy of £2435, which the poor ratepayers of Dundee would have to bear by a rate in aid. That was most absurd. Besides paying the £21,000 worth of annuities, the commissioners had to provide a large capital; they had actually borrowed £40,000 already to go on; they had to readjust the works, and to put 5000 meters into condition; they had to provide working capital, and to pay the

whole of the expenses of this enormous expensive inquiry, and all the parliamentary expenses. It could not result in less than £25,000 under those heads; that was £1000 a year more. In that there was no depreciation-fund set aside, and in the process of time all was to fall in utter annihilation. That would have to be paid, that £23,000 or £24,000, and upon the utmost estimate the profit would be £18,940. It was a result startling and absurd. In conclusion, the result was an important one. The arbitrators would have to grope their way through a massive array of figures. The importance of the question was one quite as great to the interests of the ratepayers and consumers of gas in Dundee as it could be to the shareholders. It was clear the company could not lose, because, taking even their own figures, they were considerable gainers. Taking their figures, not only did they get an inordinate amount of profit in their pockets, but the consumers of gas in Dundee were condemned for an indefinite period to have dearer, and probably bad gas, and with the extremely probable contingency of a rate in aid imposed upon them to meet this extraordinary demand. Everybody would feel that the matter had been listened to, and scrutinized, and tested with the greatest possible amount of care and attention. He was quite sure there had been a disposition on the part of the arbitrators to act judicially to arrive at the facts for the purpose of an impartial, just decision; and he did not in the least despair (and he thought it even probable) that the two arbitrators might ultimately dispense with the overs man's judgment on the matter, for the thing appeared so clear, so plain, so fully demonstrated upon the facts and figures laid before them, that it hardly could be necessary to call that gentleman in.

Mr. POWNALL said, respecting the particular way the arbitrators were to make their award, that supposing Mr. Connell and the gentleman that he consulted should be of opinion that the requirements would be satisfied by giving an annuity in one sum, the arbitrators should resist any attempt to subdivide it. On the other hand, if they were told that it was their duty to do so, it was still open to the company to accept the annuity in one sum.

Mr. HAWKSLEY said the difficulty was that the interests of the two classes of shareholders were different. He would ask whether a blank award would be agreed upon, because then no objection could be taken on the form of the award.

Mr. DAVISON: Certainly we will.

Mr. LLOYD: It is a very good suggestion, sir.

Mr. DAVISON; Perhaps you will take a note of this, Mr. Pownall, that when my learned friend deals with the commissioners accounts, by taking off 8d. from the price of gas, he raises his coal 3s. a ton at the same time for 6½ months. Then, as to Mr. Ryde's valuation, I did deal with that. You will find that, before he gets at the sum to be dealt with between the tenant and the landlord, he takes off a sum for repairs of service-pipes, £243: and then, having done that for the joint thing as between the tenant and the owner, he takes it off again as regards the tenant; and the same thing as to "General expenses," and another sum of £120. One thing, more—there must be a shower on each side.

Mr. CONNELL said he had prepared the form of award, and he proposed to lay it before Mr. Hawkins, and with his approbation to furnish copies to both parties, and, if they were not agreed, to take the opinion of Scotch counsel upon it.

Mr. DAVISON said he wished it to be distinctly understood that those who retained him in the new gas arbitration case did not wish it to be thought for a moment that they were pressing on the commissioners, or attempting to put them to any expense that could be avoided, and they were no doubt aware that possibly the award in the one case would lead to a settlement in the other. They would consent, if the other side asked it, that the time should be enlarged, otherwise the thing must go on.

Mr. LLOYD: I am not retained in the case.

Mr. POWNALL: What do you say, Mr. Thornton?

Mr. THORNTON: We do not ask anything.

Mr. DAVISON said they must go on. If the award in that case was not made by the 9th of August, unless they came to their senses and asked for an enlargement of time, they would get hold of the old company, and they had got power to buy the new. They could come to Parliament, and deal in that way, and therefore he wished that matters might be pressed forward.

After some further conversation, the proceedings terminated.

Miscellaneous News.

CITY OF LONDON GASLIGHT AND COKE COMPANY.

The Half-Yearly General Meeting of the Proprietors of this Company was held at the Offices, Dorset Street, Salisbury Square, on Wednesday, Aug. 4—ROBERT ALEXANDER GRAY, Esq., in the chair.

The SECRETARY (Mr. Millar) having read the advertisement convening the meeting, the seal of the company was affixed to the register of proprietors, and the minutes of the last half-yearly meeting were read and confirmed. The following report of the board of directors, with the statements of account approved by the auditor appointed by the Board of Trade, were then presented:—

Dorset Street, Salisbury Square, E.C., Aug. 4, 1869.

Gentlemen,—Referring to the statement made at Christmas last, your directors had anticipated that ere this you would have been called together to consider the scheme for the amalgamation of this company with the Chartered Gas Company; but they have now to report that the question remains much in the same state as when you met in February. The scheme, as provisionally agreed upon by the directors of the two companies, was forwarded to the Board of Trade, in accordance with the Act of Parliament, and it was returned in April with various suggested alterations, encumbered with conditions so adverse to the interest of both companies, that the directors found it absolutely necessary, in the interest of the several shareholders, to protest against them in the strongest terms, and the companies are now awaiting the result. Your directors are anxious that the whole subject should be submitted for your consideration, and will lose no time in calling you together for the purpose, after they have received a further communication from the Board of Trade.

Your directors have also to report that the works in connexion with the Thames Embankment are progressing, and that no step has yet been taken in respect of the compensation which will have to be paid to the company, but it is a matter which your directors have under their serious consideration.

With reference to the more immediate operations of the company, your directors are pleased to state that the gas examiner for the City has invariably reported the gas to be fully equal to the requirements of the Act of Parliament. The premises in Cannon Street for the permanent testing of the gas, to which reference was made in the last report, have, under the instructions of the gas referees, been completely fitted up with the necessary apparatus, which is now in daily operation.

The accounts for the half year, duly certified by your auditors and the official auditor, are appended hereto, and your directors consider them satisfactory. There is a slight increase in the rental, and out of the sum of £17,761 0s. 1d. now at your disposal, as shown by the general balance-sheet, your directors recommend you to declare a dividend for the half year as follows:—On the A shares, and such portion of the new shares as has been called up, at the rate of 9 per cent. per annum, and on the B shares at the rate of 4 per cent. per annum, all to be paid free of income-tax.

As you have been informed by circular, the gentlemen who retire this year by rotation are Robert Alexander Gray and John Robinson Peill, Esqrs., directors, and William Fortescue, Esq., auditor. They are eligible for re-election, and offer themselves for that purpose.

R. A. GRAY, Chairman.

THE CITY OF LONDON GASLIGHT AND COKE COMPANY,

Half Year ending June 30, 1869.

No. 1.—STATEMENT OF SHARE AND LOAN CAPITAL, *to June* 30, 1869.

Acts of Parliament authorizing the Raising of Capital.	Description of Capital.	Maximum Dividend authorized, or Interest paid.	Number of Shares issued.	Nominal Amount of Shares.	Called up per Share.	Total paid up.	Amount not called up.	Total Amounts authorized.
The City of London Gas Company's Act, 1859.	A shares.	£10 per cent.	10,000	£20 0 0	£20 0 0	£200,000	..	£200,000
	B shares.	4 ,,	10,000	10 0 0	10 0 0	100,000	..	100,000
	New shares.	10 ,,	8,000	10 0 0	10 0 0	80,000	..	100,000
	New sh., 2nd iss.	10 ,,	2,000	10 0 0	5 0 0	10,000	£10,000*	
	Debenture bonds.	5 ,,	..	..	..	60,000	..	60,000
								£460,000

* Amount paid in advance of calls on new shares, 2nd issue, £6525.

Dr. No. 2.—CAPITAL ACCOUNT, *for the Half Year ending June* 30, 1869. *Cr.*

Expenditure.	Expenditure from Dec. 31, 1868.	Expended this Half Year.	Total to June 30, 1869.
	£ s. d.	£ s. d.	£ s. d.
To Expenditure to Dec. 31, 1868	439,780 11 0		
Less—Allowance for wear and tear of meters	644 2 0		
		..	439,136 9 0
Since Dec. 31, 1868—			
Property acquired, including law charges	..	..	—
Buildings, manufacturing plant, storage works, and other structures connected with manufacture	..	..	—
New mains, including laying, paving, and other works connected with distribution	..	283 12 7	—
Meters (additional), including fixing	..	..	—
Parliamentary costs	..	77 17 1	—
			361 9 8
Special items (if any)—			
Cost of testing-station	..	..	419 13 4
Total expenditure			£439,917 12 0
Balance of capital account			16,607 8 0
			£456,525 0 0

Receipts.	Certified Receipts to Dec. 31, 1868.	Received during Half Year.	Total Receipts to June 30, 1869.
	£ s. d.	£ s. d.	£ s. d.
By Ordinary shares of £20 each	200,000 0 0	..	200,000 0 0
Ditto of £10 each	196,525 0 0	..	196,525 0 0
Bonds	60,000 0 0	..	60,000 0 0
Total			£456,525 0 0

Dr. **No. 3.—REVENUE ACCOUNT,** *for the Half Year ending June* 30, 1869. *Cr.*

Expenditure.	£ s. d.	£ s. d.	Receipts.	£ s. d.	£ s. d.
To Manufacture of gas—			By Sale of gas—		
Coals, including carriage, trimming, and dues (*see* Account No. 6)	25,076 16 0		Common gas (252,630,930 cubic feet), at 4s. per 1000 cubic feet	50,526 3 10	
Purifying materials, water, &c.	453 13 1		Cannel gas (11,504,500 cubic feet), at 5s. 6d. per 1000 cubic feet	3,163 14 9	
Salaries of superintendents and officers at works	363 6 8		Public lighting and under contracts	2,123 5 5	
Wages at works (manufacture)	7,153 17 5			55,813 4 0	
Repairs and maintenance of works and plant, including renewal of retorts, machines, apparatus, materials, and labour	1,878 16 7		Less bad debts	625 7 10	
	34,926 11 9				55,187 16 2
Less old material sold	27 15 9		Rental of meters	Nil.	
		34,898 16 0			
Distribution of gas—			Sale of residual products—		
Repair, maintenance, and renewal of mains and service-pipes, including materials, laying and paving, and labour	355 16 4		Coke (Account No. 7)	6,463 4 3	
Salaries of inspectors, assistant inspectors, and clerks in Light Office	670 16 8		Breeze ,,	138 17 9	
Wages	356 4 0		Tar ,,	1,741 0 0	
Meters—repairing, renewing, and refixing	2,014 6 4		Ammoniacal liquor	464 17 9	
		4,097 3 4		8,807 19 9	
Public lamps—			Less bad debts	18 5 0	
Lighting and repairing	..	749 14 7			8,789 14 9
Rents, rates, and taxes—			Rents	..	187 0 0
Rents	574 0 10		Transfer fees	..	2 19 6
Rates and taxes	1,015 12 6		Other items	..	—
		1,589 13 4			
Management—					
Directors allowances	600 0 0				
Salaries of secretary, chief engineer, and office clerks	1,034 3 4				
Collectors commission or salaries	446 13 4				
Stationery, printing, and general establishment charges	709 1 7				
Company's auditors	54 12 0				
		2,844 10 3			
Public officers— (*Company's Proportion.*)					
Gas referees and their expenses	..	523 11 0			
Chief gas examiner					
Official auditor					
Law and parliamentary charges—					
Law	..	71 2 0			
Parliamentary (*oppositions*)	..	—			
Depreciation-fund for works on leasehold lands	..	—			
Other item—interest	..	62 10 10			
Total expenditure		£ 44,842 1 4	Total receipts		£ 64,167 10 5
Balance carried to net revenue account		19,325 9 1			
		£ 64,167 10 5			

Dr. **No. 4.—NET REVENUE ACCOUNT,** *for the Half Year ending June* 30, 1869. *Cr.*

	£ s. d.		£ s. d.	£ s. d.
To Interest on bonds accrued to June 30, 1869	1,497 10 0	By Balance of net revenue, Dec. 31, 1868	14,149 8 5	
Forfeitures incurred during the half year	None.	Less dividends declared for the half year ending that day	13,763 2 6	
Insurance-fund, at per cent.	—			386 5 11
Income-tax	468 14 5	Balance from Revenue Account, No. 3		19,325 9 1
Balance of net revenue	17,761 0 1	Interest on deposit		15 9 6
	£19,727 4 6			£19,727 4 6

No. 5.—INSURANCE-FUND ACCOUNT. (There is no insurance-fund.)

No. 6.—STATEMENT OF COALS CARBONIZED *during the Half Year ending June* 30, 1869.

Description of Coal.	In Store, Dec. 31, 1868.	Received during Half Year.	Carbonized or Used during Half Year	In Store, June 30, 1869.
	Tons.	Tons.	Tons.	Tons.
Common	9,062½	19,011½	29,811¼	3,482¼
Cannel	1,764¼	4,147¾		692

No. 7.—STATEMENT OF RESIDUAL PRODUCTS *made and disposed of during the Half Year ending June* 30, 1869.

	In Store, Dec. 31, 1868.	Made during Half Year.	Used in Manufacture during Half Year.	Sold during Half Year.	In Store, June 30, 1869.
Coke—					
Common chaldrons.	100	24,575	9,902	14,556½	180
Cannel ,,	5	3,927½		3,969½	—
Breeze ,,	100	2,727½		2,767½	60
Tar gallons.	8,424	311,364	..	316,116	3,672
Ammoniacal liquor butts.	305	5,473	..	5,692	86

Dr. **GENERAL BALANCE-SHEET,** *on June* 30, 1869. *Cr.*

	£ s. d.		£ s. d.	£ s. d.
To Capital account—		By Cash at bankers	..	10,937 3 7
Balance at credit thereof (Account No. 2)	16,607 8 0	Ditto on deposit	..	5,000 0 0
Net revenue account—		Ditto (Petty)	..	38 5 6
Balance at credit thereof (Account No. 4)	17,761 0 1			
Insurance-fund account—		Stores on hand, viz.:—		
Balance at credit thereof (Account No. 5)	—	Coals	3,371 13 11	
Depreciation-fund (for works on leasehold lands)—		Coke and breeze	87 0 0	
Balance at credit thereof (Account No.)	—	Tar and other products	27 18 6	
Contingent-fund—		Sundry stores	2,061 15 10	
Balance at credit thereof (Account No.)	—			5,548 8 3
Unpaid dividends	366 11 1	Outstanding accounts due to the company, viz.:—		
Interest accrued and unpaid on bonds, to June 30, 1869	1,497 10 0	Light account	25,728 12 11	
Amount due for coals and to sundry tradesmen and others	16,023 5 3	Coke and other residuals	3,579 3 9	
Ditto for wages and contingencies, to June 30, 1869	—	Sundry accounts	3,151 10 9	
Deposits made by consumers	377 10 4			32,459 7 5
Special item—Mr. Benham's Benevolent Fund	1,150 0 0	Special items	..	—
	£53,983 4 9			£53,983 4 9

I certify that the balance of net revenue of the City of London Gas Company, for the half year ending June 30, 1869, is £17,761 0s. 1d., and that such amount is applicable for the payment of dividend on the ordinary shares.

(Signed) JOHN THOMAS HADLAND, WILLIAM FORTESCUE, *Auditors of the City of London Gas Company.*
August 3, 1869.

(Signed) CHARLES H. PARKES, *Official Auditor.*

The CHAIRMAN: Gentlemen, it is now my duty to make a few remarks to you with reference to the working of the company during the last half year. You have been informed by the report that we carry down a balance of £17,761, which would have enabled us to pay you a dividend at the rate of 10 per cent., but there are sufficient reasons why we do not deem it expedient to do so on the present occasion. I am sorry to say that the item of "Bad debts" in our accounts is rather heavier than usual; but it can hardly be a matter of surprise to any one connected with the trade of London that such should be the case. From all the information I can gather on the subject, I am persuaded that the trade of London was never in a state of greater difficulty than it has been of late, and, under these circumstances, we cannot wonder that we, with others, have to bear a larger share of loss than we are accustomed to in this respect. I merely mention the matter now, because it might, without some explanation, appear as though there had been a want of proper vigilance on the part of your directors and their officers. I believe I am perfectly right in attributing the increase under the head of "Bad debts" to the cause I have alluded to. As far as the general operations of the company are concerned, I am gratified in being able to say that we are in a state of comparative prosperity, although I need not remind you that gas companies have been exposed to the most vexatious opposition that any commercial undertakings were ever subject to. I hope a better feeling will soon exist, and that in the future we may be able to carry on our proceedings without that harassing interference which has so long and so prejudicially affected our interests. At all events, you may be sure of this, that your directors will use every exertion in their power to allay acrimonious feelings on the part of the consumers; for it must be obvious to you all that our duty is to seek in every respect to give satisfaction to the public, if it can be done without sacrificing the property or prejudicing the rights of the proprietors. During the present session of Parliament the Imperial and South Metropolitan Gas Companies have promoted bills for obtaining power to raise fresh capital, and I consider they have been so far fortunate in their applications to the Legislature that they have obtained their bills on more easy conditions than the City companies did last session, in relation to the illuminating power of the gas to be supplied to the public. The high standard of illuminating power imposed on us was not a matter in which we could help ourselves. We objected to it most strongly, but we found that one or two other companies supplying in the same locality were prepared to accept it, and therefore we had no alternative, and were compelled to fall in with the project. There is one thing, however, which reconciles us to the experiment—viz., that if the profits of the concern do not enable us to realize 10 per cent., we can make application to the Board of Trade for a revision of the price and illuminating power; so that though we may have to submit to the loss for a short time, it is a satisfaction to know that there is a remedy to which we can have recourse. With respect to the position of this company, it is gratifying to be able to state that everything is going on in the most satisfactory manner. The yield of gas is very good, and the quantity of coals consumed shows careful and attentive supervision. Indeed, whatever view I take of the proceedings of the company, I anticipate nothing but a state of prosperity for the future. What the result of the scheme for the proposed amalgamation may be, no one can possibly foresee. There was one proposition in connexion with it (made by the corporation of the City of London) which, I think, was most unreasonable, and to it we offered a very strong resistance; it was that within a fixed period there should be a compulsory sale of the property of the company. I think a proposition more unjustifiable never emanated from a corporate body before. I should like to know what the corporation themselves would think of an attempt being made to force them into a sale of their property within a definite period, at any price they might be fortunate enough to get for it. We have resisted their proposal to the utmost, and have every reason to believe that it is one which the Board of Trade, before whom the scheme now is, will not entertain. If they will only leave us to do the best we can, I have no doubt that, after a time, we shall be able to make satisfactory arrangements. So far as the amalgamation scheme is concerned, there is one thing you may rest assured of, and that is, that nothing will be done without the concurrence of the proprietors; and when we have heard from the Board of Trade, we shall, of course, avail ourselves of the earliest opportunity for convening the shareholders together to take their opinion upon it. Well, gentlemen, I believe I have now stated all that is necessary on the present occasion. This is, perhaps, my dying speech as your chairman, because after the adoption of the report I go out of office, and perhaps I might have said more to you if I had not felt somewhat depressed about the matter. It is at all times a great trial to part with old friends, and if you discharge me from your service my character is so damaged I shall not find a place elsewhere. (Laughter and cheers.) I beg, gentlemen, to move—"That the half-yearly report, with statements of account, be received and adopted."

Mr. HADLAND (deputy-chairman) seconded the motion.

Mr. WHITE: May I ask what is the per centage of bad debts?

The CHAIRMAN: It is about 1½ per cent. It amounts to £600.

Mr. BRUSHFIELD: No doubt the amount under the head "Bad debts" is a very large one, but I fear you will find it so with all gas companies in London. I have reason to know that what our worthy chairman has stated as to the state of trade is perfectly true, and that not only gas companies, but companies of every kind, are suffering in consequence, and are sustaining considerable loss in this respect. I came here in the full anticipation that our bad debts must have increased during the past half year, but I hope the state of trade may revive, and that we shall show a better return on the next occasion of our meeting. I am glad to hear you, sir, speak so cheerfully about the state of our affiairs; but then you always are hopeful, and I have often felt the inspiration of it when listening to your remarks, even when things looked gloomy around us. As you very well said, gas companies have been subjected to most vexatious proceedings for some years past. I am sure that if a perfect stranger to our commercial life were to come into London, and hear for the first time some of the statements which during the last three or four years have been made respecting us, he would certainly conclude that the managers of gas companies were the greatest knaves in existence. However, a better state of things seems to be coming about; I believe we have outlived these aspersions, and people are beginning to look at gas companies in a very different light to what they did. Upon the whole, perhaps, it is not to be regretted that these trials and vexations have come upon gas companies, for it has caused the directors and managers to look very closely into their affairs—even more so than they did before—just to make sure that there was no ground or pretence for the reflections cast upon them. The result, too, has been to satisfy them that they have carried on their business with the most perfect integrity, and that there is not a single blot upon their escutcheon, notwithstanding the gross allegations made against them. I do not think much of the little penny whistles of some of the agitators for cheap gas, but I have felt grieved at the proceedings of public bodies in the matter. I look back to the report of the Metropolitan Board of Works, some four years ago, when they advised Sir Stafford Northcote to let them have the management of the gas companies in their hands, and suggested terms upon which, in their opinion, they ought to be allowed to purchase up our undertakings. They proposed to issue bonds at 6 per cent., and with those bonds to purchase up our interests at par; and they stated that such was the precarious nature of the trade we carry on, that their 6 per cent. bonds would be an equivalent for our 10 per cent. dividends. They then stated that they would supply the public with 18-candle gas at 3s. 6d. per 1000 cubic feet. That was four years ago. What did the Secretary of State say to them? In effect it was—"Gentlemen, you do not understand the business;" for he asked them, "Show me how it is to be done?" which they could not do. He had no confidence in their report, and I believe the result of the whole affair was so to lower the board that they have never recovered themselves since. I have pointed to their report many times, and have felt that it was very fortunate Sir Stafford Northcote doubted the practicability of the whole proposal—fortunate for the board and fortunate for the ratepayers—for, if the scheme had been carried out, they would never have realized 2 per cent., and the ratepayers must have made up the difference. Well, gentlemen, it seems strange when we look at the state of things now, and compare it with what it was at that time. Look at the Acts obtained this session by the South Metropolitan and Imperial Companies; contrast the treatment those companies received with that which the other companies received at the hands of Mr. Cardwell and his committee. All Mr. Cardwell's ideas were thrown to the winds, and an evident desire was manifested to do justice to the gas companies. What can have produced this change? It is the result of the inquiries and investigations which have been made into the way the companies have managed their affairs, which have produced the conviction that, throughout their history, the companies have acted fairly and honestly towards the consumers. I am proud, from what I have seen lately, of being a director of a gas company, because the conviction is settling in the public mind that we have discharged our duties faithfully and honourably. If those who have agitated the question of cheap gas had allowed the Act of 1860 fair play we should, without solicitation, have been lowering the price of gas before now, and the public would have realized the fact that, in the monopoly which they have been taught was so prejudicial to their interests, they possessed the best guarantee against high prices, because it secured the companies against the necessity for extravagant expenditure, while it limited their dividends to 10 per cent. It is very satisfactory to know that, even in the City Gas Act of last session, the fact that shareholders in gas companies are entitled to 10 per cent. is recognized, and that it contains a provision for enabling them to reach that maximum should their profits, from the increased obligations put upon them, be diminished. Under all the circumstances in which we are placed, I am very much disposed, with our worthy chairman, to look hopefully upon the future of gas companies; and I congratulate the proprietors generally upon the favourable report which has been laid before us to-day.

The CHAIRMAN: Our good friend has alluded to the conduct of the Metropolitan Board, and the offer they made to purchase the interests of the gas companies at par, with 6 per cent. bonds. Our shares at that time were probably at 50 per cent. premium, as we were paying good dividends, so that those who had purchased shares in the market would receive about 3 per cent. on their investments, if the offer of the board had been carried out.

The motion was then put, and carried unanimously.

Mr. BRUSHFIELD moved, and Mr. WEST seconded, the following resolution:—"That, agreeably to the recommendation contained in this day's report of the board of directors, a dividend out of the profits of the concern for the half year ending the 30th of June last, be now declared as follows:—On the A, and on the amount called up on the new shares, at the rate of 9 per cent. per annum; and on the B shares, at the rate of 4 per cent. per annum; the whole to be paid, free of income-tax, at the company's office, on the first Tuesday in October next, and on each succeeding Friday and Tuesday, between the hours of twelve and one o'clock."

The CHAIRMAN, in putting the resolution, said that the bad debt which the company incurred some years ago by the failure of their treasurer, Sir Charles Price and Co., had been so far written off that there only remained £1434 9s. 6d. to the debit of that account. After providing for all contingencies, and paying the dividends now proposed to be declared, there would be a balance of profit to carry forward of £666.

The motion was put, and carried unanimously.

Mr. LEWIS: I beg to move—"That Robert Alexander Gray, Esq., be re-elected a director of the company." There cannot be any necessity to multiply words in proposing such a resolution. Every one present is aware how much we are indebted to Mr. Gray; his services to this company and to gas companies generally have been of no common order, and I rejoice to see him, though far advanced in life, with his energies and powers in unabated activity and vigour, zealous as ever to promote, by his influence and ability, the cause with which he has been so long and so honourably identified.

Mr. BRUSHFIELD: I must ask permission to be allowed to second this resolution. I have had some experience of gas companies and directors, and I have passed through the ordeal to which the metropolitan companies have been exposed, and the danger with which of late years they have been threatened, yet I never saw my worthy friend, Mr. Gray, despair. I have never seen him but what he has been full of hope; he knew the honesty of the course in which he was embarked, and he had confidence that right principles would at last prevail. I believe him to be one of the firmest men in existence, and one of the wisest. During the agitations of recent years there have been many drooping men among proprietors, whose fears led them to sacrifice their interests; but Mr. Gray has always stood firm, and was always to be found in his place. He has been the very soul of gas companies in London, and I believe that he will live to see the complete triumph of those sound principles which he has always advocated in relation to these undertakings.

The resolution was put, and carried by acclamation.

The CHAIRMAN: Gentlemen, I cannot but feel deeply indebted to you for the kind manner in which the mention of my services has been received. I take it for granted that if I had not done my duty you would not have re-elected me to-day. I have been associated with the company since 1829, and have been a director all that time. I have seen great changes in one way or other, but, as my worthy friend says, I have never despaired. I hope we are now in a position to enjoy a little of that peace and quietness to which we are entitled; but if, contrary to my expectations, we should again be embarked in a struggle for the defence of our rights, I trust the same energy which has distinguished me for many years will not be wanting to protect our interests. Gentlemen, I sincerely thank you for the honour you have done me on this occasion. Probably, at my advanced period of life, I may never ask you again to re-elect me; and if I should

become incompetent for the discharge of my duties, my incompetency will come to my own knowledge first, and I shall at once give you the opportunity of appointing some one in my place; but while my energies are preserved to me I shall not relax in my efforts to promote the welfare of the company.

Mr. H. WALMISLEY moved—"That J. Robinson Peill, Esq., be re-elected a director of the company."

Mr. CAULFIELD seconded the motion, which was unanimously adopted.

Mr. PEILL: Gentlemen, I thank you most sincerely for this renewed mark of your confidence. I consider it a great honour to be associated with gentlemen like our chairman and the other directors at the board, and I am happy to say that in all our deliberations the greatest unanimity has always prevailed. I congratulate the proprietors on the termination of those questions respecting the gas supply of the metropolis which have so long agitated the public mind, and I hope we shall be allowed for the future to conduct our affairs in peace and quietness, by which means we shall be best enabled to fulfil the reasonable expectations of the consumers, and to secure for the proprietors that fair and equitable return for their investments which the Legislature has declared they are entitled to receive. I thank you most cordially for re-electing me, and can assure you that so long as I have the honour of a seat at the board I shall exert myself for the interests of the company, in doing which I shall be doing what is most congenial to my own feelings.

Mr. LAVANCHY: I rise for the purpose of proposing the re-election of Mr. Fortescue as an auditor of the company. In doing so I may just be allowed to say that I considered it my duty to avail myself of the privilege of inspecting the books, and I can assure you that nothing could give more satisfaction to my mind than that inspection afforded. The admirable principle upon which those books are kept is such as to afford the utmost confidence to the shareholders, and it is, therefore, with very great pleasure that I propose the re-election of Mr. Fortescue, whose important duties, as one of our auditors, I am sure we are all prepared to acknowledge.

Mr. WEST seconded the motion, which was carried unanimously, and Mr. FORTESCUE briefly acknowledged his obligations to the meeting.

Mr. WHITE moved—"That the best thanks of the shareholders are due, and are hereby presented to the chairman, deputy-chairman, and directors, for their efficient management of the company's affairs during the past half year."

Mr. PHILLIPS seconded the motion, which was unanimously adopted.

The CHAIRMAN: I can assure you, gentlemen, that nothing can be more gratifying to the feelings of your directors than to know that they enjoy the confidence of the shareholders. We endeavour to perform our duty to the best of our ability, and the compliment you have just paid us shows that in those endeavours we have been successful in gaining your approbation.

Mr. SMITH moved, and Mr. WEST seconded, a vote of thanks to the auditors, which was carried unanimously.

Mr. J. T. HADLAND acknowledged the vote for himself and colleague. The duties of their office, he remarked, were very arduous, but they were performed most cheerfully, and the auditors felt rewarded in witnessing the growing prosperity of the company, and receiving from time to time the thanks of the proprietors for their services.

The CHAIRMAN: I should be extremely unwilling that this meeting should separate before we had paid that meed of praise to our officers which they are justly entitled to.

Mr. BRUSHFIELD: I was just about to observe that, having complimented our directors and auditors for their valuable services, we must not forget those upon whom the working departments of the undertaking devolve. I believe the City Gas Company is officered as well as any company in London, and our esteemed friend, Mr. Millar, stands at the top of the tree as secretary. I have great pleasure in proposing that the thanks of the meeting be presented to him and to the other officers of the company for their zealous attention to the discharge of their respective duties.

Mr. WHITE seconded the motion.

The CHAIRMAN: I cannot permit the meeting to adopt the resolution without expressing my cordial assent—as I am sure I do that of the other directors—to all that has been said in reference to our officers. My worthy friend, Mr. Millar, has been nearly half a century in the service of the company, and I do not know of one instance in which he has not given us satisfaction. It would be unnecessary for me to enlarge upon this subject. I will only say that we have a body of most efficient officers, that they discharge their duties most faithfully, that they thoroughly identify themselves with our interests, and do all in their power to advance the prosperity of the company.

The motion was put, and cordially adopted.

Mr. MILLAR: Sir, on behalf of the officers of the company, I have to thank you and Mr. Brushfield for the kind words in which you have noticed our services. Leaving myself out, I think I can vouch for all that you have said in their praise, for I believe that you have in all, but especially in the superintendents of the different departments, a body of most efficient men—men who combine intelligence with integrity. For myself, I have, as you, sir, remarked, been nearly half a century in the service of the company, and for the expression of kindly feeling towards me by yourself and the board, I offer you my grateful acknowledgments.

On the motion of Mr. LEWIS, seconded by Mr. LAVANCHY, a cordial vote of thanks was given to Mr. Gray for his conduct in the chair.

The CHAIRMAN briefly ackuowledged the vote, and the proceedings terminated.

SOUTH METROPOLITAN GASLIGHT AND COKE COMPANY.

A Special Meeting of the Proprietors of this Company was held at the London Tavern, on Wednesday, Aug. 4., to consider and determine upon the mode of raising the new capital authorized by the company's Act of this session—T. B. SIMPSON, Esq., the chairman of the board of directors, presided.

The SECRETARY (Mr. Livesey) read the notice convening the meeting, also the following report:—

The directors have much pleasure in being able to report that the Act authorizing the company to raise additional capital, to the extent of £250,000, received the Royal Assent on the 26th of last month.

The Act is very similar to that obtained by the Chartered Gas Company in the session of 1868, and, though some of its provisions are of a very stringent character, the directors consider they will have little or no difficulty, coupled with the assistance and attention of their officers, in conducting the affairs of the company as prosperously as they have hitherto done, and as satisfactorily to the public and consumers generally.

In accordance with the Companies Clauses Consolidation Act, incorporated in the company's Act just passed, the directors now recommend that the amount of capital authorized to be raised be allotted among the registered shareholders *pro ratâ*, in shares of £12 10s. each, and that the same be made payable from time to time, as the extension of the business may require.

The directors propose that the first call be 20s. per share, and that it be payable on or before the 6th of September next.

The CHAIRMAN: Gentlemen, in moving that the report just read be received and entered on the minutes, I have but very few words to say. In the first place, I remark that though the report is short, it tells you exactly what we have called you together for. The directors are gratified that the bill promoted by them in Parliament this session has become law, inasmuch as for the last few years the trouble and anxiety which they have had in carrying on the operations of the company have been considerable. We have had many difficulties to contend with, and at times have scarcely known in what position our property really stood, or what steps it would be best to take to secure your interests. It is not at all necessary that I should trouble you by going into details respecting the difficulties by which we have been surrounded, as they are now, fortunately, surmounted to a certain extent, for although we have not obtained exactly the Act we desired, I think we may expect that under it, by good management and constant attention, we shall be able to secure in the future that return upon your capital to which you are fairly entitled—viz., a dividend of 10 per cent. I feel on this occasion fully justified, as I have done on previous occasions for many years past, in congratulating you that you have in this company as sound and excellent a business as it is possible for men to have. As far as human knowledge and experience can guide us to a conclusion, your directors believe the business of the company to be based upon a good foundation, and that it only needs the vigilance and persevering attention which they and the officers by whom they are surrounded are fully prepared to give, to secure from it all the benefits which the Legislature allows us to derive. Without troubling you, therefore, with the details of the difficulties we have had to contend with, but again congratulating you upon the present position and prospects of the company, I move the resolution.

Mr. RHODES seconded the motion, which was carried unanimously.

The CHAIRMAN: Gentlemen, I now move—"That the additional capital of £250.000, authorized by the South Metropolitan Gaslight and Coke Company's Act of 1869, be raised by the creation and issue of new ordinary shares of £12 10s. each, and that the same be allotted *pro ratâ* to the ordinary shareholders."

Mr. GRAY, in seconding the resolution, said: I think the proprietors now assembled must feel deeply indebted to the directors for the manner in which the proceedings in Parliament this session, in connexion with our bill, have been conducted. I have had some experience in Parliament myself, in relation to private bill legislation, and, Heaven knows, one had better almost be in the House of Correction. A vast deal of talk is heard about reform in matters in which the public have very little interest, while in those matters which affect private interests no attempt at reformation is made. For my part, I have no confidence in committees of Parliament, and I think it would be far better for all parties that some tribunal should be established composed of persons thoroughly acquainted with the subjects likely to be brought forward. Whether such a thing is possible or not, of one thing I am sure, and that is, some mode should be adopted to reduce the expenses to which gas and other companies are put by frivolous applications to Parliament by designing men, who seek only to promote their own selfish purposes, regardless of the damage they inflict upon us. With reference to the proposal now before the meeting, I think the plan of the directors is a good one. I have no doubt they have given it their best consideration, and in recommending it for our adoption believe they are doing that which will most conduce to the permanent well-being of the company. I shall not detain the meeting with any further observations, but conclude by expressing again my hearty thanks to the directors for the able manner in which they have carried this matter through.

The motion was put, and carried unanimously.

Mr. MAUGHAN asked whether the calls would be £1 each.

The CHAIRMAN said they would, the first, as stated in the report, being payable on the 6th of September.

Mr. GRAY inquired at what intervals further calls would be made.

The SECRETARY replied that probably no further call would be required for twelve months.

Mr. MAUGHAN: As the business of the meeting is now concluded, I beg to move a vote of thanks to our worthy chairman and his colleagues for the able manner in which they prosecuted our bill in Parliament. I think we have got our bill through in a manner which ought to be satisfactory to ourselves and the consumers, and I have no doubt that, with the same good management which has hitherto been pursued in the conduct of the company's affairs, we shall be able still to realize a fair dividend upon our shares, while carrying on our business to the interest of the public at large. I feel very pleased at the way in which we have come through the severe ordeal of Parliament. We are, perhaps, better entitled to consideration at the hands of the Legislature than some other companies, because of the moderation of our charges, and I really think that, as between the public and ourselves, we have obtained a very fair Act.

Mr. MALTBY seconded the motion, which was cordially agreed to.

The CHAIRMAN: Gentlemen, I am sure we are much obliged to you for the compliment paid to us, though it is only a repetition of the expression of confidence and approval you have so often given utterance to at your meetings. With regard to what my friend, Mr. Maughan, has just said, I confess that I do not think we have had very much favour shown to us by Parliament. We felt that we were fully entitled to some consideration, and there were many little clauses in the bill which we hoped to get modified, but I have not gone into these matters because I am apt to get warm when I speak of them.

A PROPRIETOR: I believe there was no real opposition to us from the consumers.

The CHAIRMAN: It is a most extraordinary thing that we never had any complaints at all till lately. Every one was contented until they were told by certain parties that they were being very badly treated by us. Under our new Act we shall have one advantage—viz., that those who are discontented can go to the referees. I hope that those complaints, which have been the source of irritation during the last few months, will now cease, but if not, we shall throw the load off our shoulders, and leave it in the hands of the referees to decide how far any of these complaints are well founded. I again thank you for the compliment you have paid us, and can only reiterate the assurance I have so often given, that no effort on our parts will be wanting to secure the prosperity of the company.

Mr. MAUGHAN: I think it would be a deserved reproach upon us if we did not offer a special vote of thanks to our most excellent manager, Mr. Livesey, on this occasion. I know the anxiety he has imported into the matter, the trouble he has taken, and the sound judgment he has brought to bear upon it. He has been exceedingly useful to us in this as in all matters in which his advice and assistance are enlisted.

Mr. HILL seconded the motion.

The CHAIRMAN: I have great pleasure in putting the resolution before the meeting, inasmuch as it is one which the directors cordially approve of.

The motion was put, and carried unanimously.

Mr. MAUGHAN: I hope something more than a mere vote of thanks will be accorded to Mr. Livesey. He has been a most invaluable officer of the company, and I am sure that every proprietor appreciates his services. I do not make any specific proposition on the subject, but leave it in the hands of the directors.

The CHAIRMAN: Depend upon it, the directors will not lose sight of the suggestion.

Mr. RIELY: All the shareholders entertain the same opinion as that just expressed by Mr. Maughan. So much of our prosperity depends upon the good management of Mr. Livesey, that I think he is fairly entitled to all we can give him.

Mr. LIVESEY: Gentlemen, I thank you most sincerely for the very kind way in which you have expressed your approval of my conduct, and I feel especially obliged to Mr. Maughan for the manner in which he proposed the vote you have just adopted. I certainly have taken a very active part in the proceedings connected with our bill, for I considered that the session of this year would be the most favourable one for obtaining parliamentary sanction to pay the dividend we are justly entitled to have. In my opinion, considering what we have done for the consumers in our district, we were fairly entitled to a better Act than we have obtained; but perhaps, under all the circumstances, we have not much reason to complain. I have not the slightest doubt that by strict attention and care we shall be able to pay our full dividend, although some of the penal clauses are unnecessarily severe.

The proceedings then terminated.

RATCLIFF GASLIGHT AND COKE COMPANY.

The Half-Yearly General Meeting of the Shareholders of this Company was held at the Company's Offices, Cable Street, E., on Tuesday, August 10—ANDREW WILSON, Esq., in the chair.

The SECRETARY (Mr. H. J. Baddeley) read the following report and trade account for the six months ending the 30th of June:—

The directors have much pleasure in presenting their report and accounts for the half year ended June 30, 1869.

The directors have been and still are engaged in making improvements and alterations in their manufacturing station, under the advice of a consulting engineer, to meet and anticipate the requirements of recent and future legislation.

The accounts, which have been duly audited, show a net profit of £6710 11s. 3d., out of which the directors recommend that a dividend upon the paid-up capital of the company, after the rate of £5 per cent., for the half year ended June 30, 1869 (less income-tax), be now declared, payable on and after the 9th day of October next.

A resolution to increase the secretary's remuneration, from the 1st of January last will be submitted at this meeting for your adoption, pursuant to Act of Parliament.'

Dr. *Trade Account, for the Six Months ended June* 30, 1869. *Cr.*

To Directors allowances	£400	0	0	By Gas-rental	£14,895	16	11
Salary of secretary and clerks	411	13	0	Less bad debts and allowances	152	3	2
Collectors commission and pay	203	14	0		14,743	13	9
Rent, rates, and taxes of offices	33	11	0				
Stationery, printing, and general charges	122	8	10	Public lighting and under contracts	2,072	2	7
Payment to auditors	15	15	0	Rental of meters	3	17	2
Coals, including carriage, dues, &c.	6,830	11	6	Sale of old materials	18	15	10
Purifying materials	167	6	6	Coke	2,724	17	7
Supervision and labour	3,296	15	11	Breeze	58	17	5
Tools and other implements	174	0	4	Tar	449	5	2
Ordinary repair and maintenance of premises	613	4	0	Ammoniacal liquid	105	0	0
Rents, rates, and taxes of manufactory	592	1	3	Miscellaneous receipts	94	5	7
Distribution—ordinary repair and maintenance	182	19	3				
Meters — restoring and replacing	14	8	3				
Leaseholds Redemption Fund.	110	0	0				
Interests on borrowed capital.	391	15	0				
Net profit	6,710	11	3				
	£20,270	15	1		£20,270	15	1

The CHAIRMAN, in moving the adoption of the report, said it was unnecessary to dwell at length upon the statements it contained, nor was it necessary to comment upon the accounts, which were, perhaps, as satisfactory as any accounts ever laid before a meeting of shareholders. The report informed them that the directors were carrying out extensive alterations at the works, those alterations being rendered necessary to meet the requirements which were being put upon gas companies by the Legislature. It was, no doubt, well known to every one present that a higher standard of illuminating power and purity was being imposed upon them, and the directors were, therefore, expending a large amount of money in altering the condensers, scrubbers, and purifiers, and they had hoped that, by the time they met the shareholders, they would be able to report that these alterations and improvements were all completed. He regretted, however, to say that they were not. It was no fault of the consulting engineer, under whose advice they were acting; but some castings having been broken, and others found not quite up to the mark, a little delay had taken place. These matters had been remedied, and it was hoped that by next month the improvements would come into full operation. A portion company would then be in a position of equality with any other. A portion of the frontage of the company's property at Wapping had been purchased by the local authorities, for effecting a public improvement in the street, and the directors expected that this transaction would be completed before the present meeting; but such was not the case, and therefore the amount to be received did not come into the half year's accounts.

Mr. PITT asked how the money to be received would be applied.

The CHAIRMAN said it would be carried to the credit of the capital account, as representing a portion of the sum which the company had expended in the purchase of the freehold.

Mr. BROMLEY seconded the adoption of the report.

Mr. PITT said as it appeared from the accounts that the directors had money in hand more than sufficient for the purpose, he thought it advisable that they should employ it in reducing the bonds of the company, and thus save an amount which was annually paid for interest.

The CHAIRMAN replied that though they had money in hand at the present time, it would all be required before the directors met the shareholders again, so that if it were employed in the way suggested it would be necessary to borrow again to pay for the alterations now going on at the works. The proprietors might be sure that the £5000 was not allowed to lie idle; it was out on deposit, and interest was received upon it. With reference to the general position of metropolitan gas companies, he thought he might congratulate the shareholders. Two of the companies had obtained Acts during the present session, under which they were required to supply 14-candle gas, but they had their 10 per cent. dividends secured to them upon due care and management; so that for the next few years, at least, he thought the shareholders of the Ratcliff Company need not fear much harm, as no one could charge the board with a want of due care and management.

Mr. LAMBERT remarked, in reference to an observation which had been made, that it was not many years since the directors were obliged to borrow money to pay the dividends. He was glad to know that on this occasion they had money in hand, so that they need not have recourse to their bankers.

The motion was put, and carried unanimously.

The CHAIRMAN moved—"That a dividend for the half year ended June 30, 1869, upon the paid-up capital of the company, at the rate of 5 per cent. (less income-tax), be now declared, payable on the 9th of October next."

Mr. BADDELEY seconded the motion, which was put and carried.

The CHAIRMAN said the last paragraph in the report informed the meeting that it was intended to submit a resolution to increase the remuneration of the secretary. This was a matter which, in accordance with the provisions of the company's Act, required the sanction of the shareholders, and was not within the competence of the directors to determine. In recommending the meeting to make the proposed increase, he could assure the shareholders that the directors believed the secretary was thoroughly worthy of it. He knew of no company in which the secretary was more entirely identified with the interests of the shareholders. His whole time and energy were given to the work, and he was always ready and willing to furnish the best information in his power on all questions affecting the undertaking. Of late years the business of the company had considerably increased, and a corresponding addition had necessarily followed in the duties and responsibilities of the secretary. He had, therefore, much pleasure in moving—"That the secretary's remuneration be increased £100 per annum at and from the 1st of January last."

Mr. LAMBERT said, as an old shareholder, and one who had known and had transactions with the secretary for many years, he was glad of the opportunity of expressing his respect for and confidence in him by seconding the resolution.

Mr. PITT supported the motion, which was put, and carried unanimously.

The SECRETARY returned thanks for this practical proof of the kind feeling of the proprietors towards him, and assured them of his determination to continue that course of conduct which had secured for him their confidence.

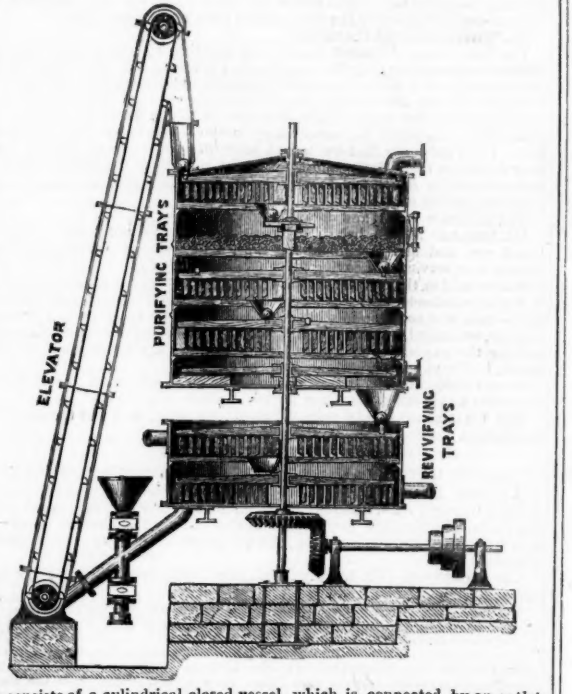
After some conversation upon a motion by Mr. Pitt with reference to the banking account of the company, a cordial vote of thanks was given to the directors for their services in the past half year.

The CHAIRMAN acknowledged the resolution, and expressed a hope that it would be his happiness for many years to meet the shareholders under circumstances as prosperous as at present.

A vote of thanks to the secretary, which was duly acknowledged, closed the proceedings.

M'DOUGALL'S PATENT SELF-ACTING PURIFIER.

In his Inaugural Address at the Liverpool Meeting, the President of the British Association of Gas Managers briefly alluded to a very ingenious apparatus invented by Mr. Arthur M'Dougall, of the firm of M'Dougall Brothers, Manchester, to be employed as a gas purifier. The accompanying engraving represents a vertical section of this improved self-acting apparatus.



It consists of a cylindrical closed vessel, which is connected by an outlet-pipe with the gasholder, and is furnished with a gas inlet-pipe, through which the gas to be purified enters the purifying vessel, each of which pipes is provided with the usual valve. In the centre of the cylindrical vessel is a vertical shaft, supported in its central position by suitable bearings, and receiving a rotatory motion by the aid of bevel wheels or other gearing, driven by a strap or otherwise from any convenient prime mover. At suitable intervals along the interior of the cylindrical vessel are

fitted four or five open or perforated floors or traps of wood, metal, earthenware, or other suitable material, through the centre of which the vertical shaft revolves freely. To this shaft, and a little above the surface of each of the open or perforated floors, there is secured a cross-arm extending nearly from side to side of the cylindrical vessel. Each of these arms carries a number of plates or stirrers, forming a rake, so arranged as to tend, when revolving in the proper direction, to gradually urge or move the gas-purifying agent, contained upon the perforated floor, from the centre to the circumference thereof, and at the same time to turn over such substance after the manner of the turn-furrow of a plough. In this way it is obvious that a complete stirring or turning over of the material is accomplished. One or more discharge openings are left at or near the circumference of each floor, in order that the oxide or other purifying agent may drop into a feeder, by which it is conveyed to the next floor below, and so on throughout the series of floors. The gas to be purified is admitted through the inlet-pipe at the bottom of the cylindrical vessel, and thence passes through the several perforated floors, and through the oxide or other purifying agents contained thereon, and passes out in a purified condition through the outlet-pipe at the top to the gas-holder. The purifying material having, by the revolution of the arms, been carried to the lowest floor, it is allowed to fall into a hopper, through which it passes into a receptacle or chamber beneath, containing two or more floors, with revolving arms and stirrers. Here it is exposed to a powerful air draught from the chimney, which acts as a revivifier, and fits it again for use. It is then discharged through a pipe at the bottom into an elevator, by which it is raised to the top of the vessel, and again passed through the apparatus. The discharge-pipe is provided with a branch outlet, through which the spent oxide may be discharged, instead of being returned to the vessel through the elevator, and with a hopper, by means of which fresh purifying material is supplied. The patent purifier entirely dispenses with manual labour, both in charging and discharging, and in the revivification of the material employed. In ordinary gas purifiers great labour is required in filling and emptying them, the course of the gas has frequently to be changed during these operations, and a large quantity of gas is lost at each removal of the lid or cover of the purifier. By means of this apparatus, not only is the gas more effectually acted upon by the purifying agent employed, but, from the fact of the apparatus being self-acting, it causes a constant supply of fresh purifying material to pass through it. Its action is continuous, and has not to be thrown out of work whilst charged and discharged, like present purifiers; thus in a gas-work only half the number would be required. Apparatus similar to this in principle, and included under the same patent, are being adopted at chemical works, for the treatment of large quantities of pulverized material with gases. The cost of manipulation, as compared with that of manual labour, shows a very important saving, whilst the regular and constant action of machinery secures more uniform results.

BRITISH ASSOCIATION OF GAS MANAGERS.

LECTURE ON SOME NEW CONTRIBUTIONS TO THE CHEMICAL AND TECHNICAL HISTORY OF COAL GAS.

By ALFRED G. ANDERSON, Esq.,
Professor of Practical Chemistry at Queen's College, Birmingham.

(*Concluded from page* 636.)

Now, having shown you that both carbonic oxide and hydrogen *per se* have no illuminating power whatever when consumed in a gas jet, what I propose to do next is to burn the same proportion of either with a hydrocarbon body like olefiant gas, or with some of the coal gas supplied to this room. The latter plan, I think, perhaps will be preferable, as furnishing the best practical illustration. It is certainly otherwise quite immaterial which example we select. [Experiment made, half a volume of hydrogen being mixed in the jar with half a volume of the gas from the main.] Please observe that, in the case of this hydrogen admixture, a certain amount of illuminating power is developed at this jet: when, however, we substitute for the hydrogen carbonic oxide—[experiment made, half a volume of carbonic oxide and gas being then mixed and consumed]—you cannot fail to note a very marked diminution in the light-affording power of the jet.

I have instituted many carefully conducted experiments, with the view to ascertain the proportion of this reduction; but, unfortunately, it is hardly within the scope of a lecture to bring such exact results under your notice. From measurements of comparison of the two results, I have arrived at this conclusion—that carbonic oxide in admixture with coal gas reduces the illuminating value of its light-giving ingredients (the hydrocarbons) to the extent of 75 per cent.; that is, supposing we get a light-giving power from admixture with hydrogen equivalent to 1, we get in the case of carbonic oxide substitution a light-giving power equivalent to *one-fourth* only.

These experiments need to be again repeated, in order that we may see perfectly the relations borne by the non-illuminants in question to the light-givers. I will once more, therefore, take this jar, which you will perceive is graduated into divisions, and add to it to the extent of one-half, pure carbonic oxide, after which I shall effect the transfer of another half bulk of coal gas into the jar from this gasholder, and allow them to remain at rest for a few minutes. [Experiment performed.]

I enter into this part of the topic especially—perhaps almost tediously—because I think events will hereafter show that it may become advisable to effect the entire removal of carbonic oxide from coal gas. I think you will be disposed to quite agree with me when you again see, as this experiment will demonstrate, that the mischief done to the illuminating ingredients by its burning in contact with them is very obvious. It probably arises from this cause—carbonic oxide undergoing combustion in atmospheric air produces nothing but carbonic acid. That gas is said to be a great source of mischief to illuminating power, especially, it has been stated, when more than 2 per cent. of this carbonic acid exists in coal gas.

I may here mention, to anticipate what may possibly be a difficulty arising in some of your minds, that the act of diffusion or "mixing" of the gases, which we have more than once put together in this jar, does not occupy long, when we have added our two gases together, so that the comparative results we get under these circumstances very nearly approach accuracy. Diffusion is a peculiar physical property of gases possessing no disposition to unite chemically, by which, even when largely differing in density, they rapidly mix together. Thus, if the heavy gas, carbonic acid, is poured into a jar, and some of the light gas, hydrogen, is then placed over it, in a very short time the heavy gas rises into the hydrogen, while the light one passes downwards into the carbonic acid, until the two become in a state of thorough and perfect intermixture. Now we have our mixture of carbonic oxide and coal gas made: it only remains for us to burn this with the same jet by which I have consumed, you may recall to mind, in the first place, olefiant gas, of the class of the butylene, or illuminating, series; in the next place, carbonic oxide gas and hydrogen, of the non-illuminating type.

I must now beg to draw your attention, as far as the eye can judge from the results, to enable you, if possible, to form an opinion regarding the illuminating power of the gas I am now going to consume. [Experiment of burning the gas with Argand burner and glass chimney performed, as before.] I think the eye, in this instance, will permit you to form a very distinct opinion of the illuminating value of this specimen of gas now burning. Let us recollect that we are here consuming together a certain proportion of carbonic oxide mixed with a certain proportion of Liverpool coal gas, those proportions being equal bulks of each.

We can see there is a material destructive effect produced on the illuminating power of the gas, if you have been able to recall the degree of illumination afforded in the hydrogen coal-gas experiment.

Now, I will take the same bulk of Liverpool gas, and burn it with hydrogen, as a reminder of the effect of the experiment in question. [The jar was half filled with pure hydrogen, and the same measure of gas from the gas supply of the room was then added. After a few minutes rest, the usual water pressure was applied to the lower orifice of the jar, and the mixed gases were burned by the Argand burner as before. Then the carbonic oxide and gas mixture experiment was repeated.] Well, we can now, I think, distinctly perceive that the carbonic oxide of coal gas cannot but be a source of considerable mischief to its illuminating power. We are even unable to see to read with the flame of this mixture—[attempt made]—it is, to my eyes, at least, utterly impossible. In fact, I think you may possibly gather, from the appearance of this flame, that what I have already stated—viz., that this gas gives an amount of illuminating power equal to about one-quarter, as compared with the other gaseous mixture of coal gas and hydrogen—really overvalues its illuminating power.

We will now once more burn the mixture of hydrogen in association with Liverpool gas, having cleared from the holes of the burner a little water, which, by stopping the flow of gas from the orifices of the burner, somewhat interfered with the success of the last experiment made with the hydrogen mixture.

As the last experiment but one illustrating these contrasts of results, let me draw your particular attention to the greater development of light afforded in this instance. [Experiment performed, the flame burning perfectly.]

Now, we cannot deny, I believe, that gas is occasionally supplied—in fact, I have seen coal gas burning, in some towns I have visited, which possessed very little, if any, more illuminating power than this mixture of hydrogen and coal gas which we have now burning before us.

It only remains—having in this experiment very correctly ascertained the degree of light which this hydrogen mixture with the illuminating constituents of coal gas affords—to repeat once more, without loss of time (so as to get instant comparison), the experiment of burning them, bulk for bulk, with carbonic oxide. We can then, I feel certain, as the result of our observations, form our conclusions as to the data in a very satisfactory way. [Experiment performed.]

Here we have a very considerable obliteration of the illuminating power of this gaseous mixture. [This experiment was very decisive in showing the great superiority of the hydrogen mixture over the corresponding carbonic oxide experiments.]

I wish to firmly impress upon your minds that it has not been possible for me to institute any more exact means for measuring illuminating power at this table, to be within the limits of a lecture. I have therefore ventured—I fear not without taxing your patience—so to repeat the experiments, that you might be put in possession of a distinct conviction as to the degree of illuminating power which coal gas and light-affording hydrocarbons possess when burned in association with a given volume, on the one hand, of hydrogen gas, and, on the other, the same volume of carbonic oxide.

I have, I hope, now succeeded in actually demonstrating to you, Mr. President and gentlemen, the deleterious effect, upon the illuminating ingredients in coal gas, of carbonic oxide gas. I feel very sure the time will come when you will regard carbonic oxide of coal gas as you do its other impurities and objectionable constituents, such as sulphuretted hydrogen, ammonia, bisulphide of carbon, &c., and adopt such means for its removal as science, justified by practical experience, may place at your command. And I have also, I trust to your satisfaction, succeeded in showing that the two non-illuminating constituents, hydrogen and carbonic oxide, always present more or less in quantity in coal gas—hitherto held as perfectly correspondent in their peculiar relations to coal gas and its illuminating hydrocarbons—for the future must, in this regard, be dissevered from association.

With your permission, I will now proceed to show you another experiment. I am afraid, however, I am occupying so much of your time, that I hardly dare to trespass much further upon it. I think, if I make one more experiment, that experiment will enable me to demonstrate to you that there is an easy means by which you may entirely, and in a technical sense, too, when it is conclusively seen to be necessary, remove the carbonic oxide from coal gas. I have said it is my opinion that, owing to the destructive action of carbonic oxide when present in coal gas in the way I have indicated, it would be good policy to get rid of it altogether, inasmuch as it exists in coal gas to the extent of from 5 to 16 per cent. Dr. Letheby and Dr. Odling have stated that the limits of its presence are about confined by these numbers, and so I have found from my own observation.

Now, in regard to taking it out of gas. Well, if we shake up carbonic oxide gas, and what is called cuprous chloride (this used to be called, under the old theories of chemistry, subchloride of copper), this copper salt will absorb every particle of it. The direct absorption of carbonic oxide by cuprous chloride is a reaction remarkable in itself. Only a few days back I was led to consider, while employing the process, whether or not the effect was due to the absorption through further oxidation of the salt by the oxygen from the carbonic oxide, and the consequent separation of carbon.

I propose to pass some carbonic oxide into this tube. I will show you then that I can absorb it rapidly—in a few seconds. But I may tell you at the same time this fact: that there is nothing whatever—no known means existing—for, in a like manner, absorbing the other non-illuminant—the hydrogen. By burning it with oxygen into water we proceed universally when we desire to effect the removal of hydrogen from a gaseous mixture. As far, however, as carbonic oxide is concerned, I can soon fill this tube with it. [Performed.]

We have it now filled with carbonic oxide, and I will proceed to agitate it with the so-called subchloride of copper. My object, please to recollect, is to show that we can thoroughly absorb the carbonic oxide by agitating it with this metallic chloride. [A Cooper's tube, full of carbonic oxide, was taken; the water was removed from the short limb, replaced by solution of cuprous chloride, corked tightly, and agitated. After this the fluid contents

of the tube were wholly conveyed again into the short limb under the corked orifice.] I propose now to open the corked end under water, and you will remark the absorption of the gas, as proved by the rush, through the pressure of the atmosphere, of the water to occupy the vacuum. [Experiment performed.]

In the experiment I have just made there is nothing whatever novel. In methods of gas analysis employed during the last twenty years, the cuprous chloride, or the subchloride of copper, has been commonly used for the absorption of carbonic oxide, and when in admixture with other gases; so that in bringing it before you to-night, I simply do so as illustrative of the method by which, should you at any time be desirous, for the reasons I have expressed, and which I hope I have made very patent to you, to remove the carbonic oxide from coal gas, you can do so by using a purifier charged with brushwood over which subchloride of copper trickles, and there can be no doubt we might find some other metallic solution which would take it out of the gas quite as effectually as the cuprous chloride does. Just as it is considered good policy to remove all the carbonic acid gas by a purifying agent, I am quite sure it would be equally advisable to make a point of also removing all the carbonic oxide.

In *ordinary* coal gas it exists only to the proportion usually of about 8 to 10 per cent.; and if you just consider for one moment what is said to result, in the way of mischief, to the illuminating power of the gas if 2 per cent. of carbonic acid be contained in it, you may readily understand that, inasmuch as carbonic oxide burning in the flame with the other ingredients produces carbonic acid, if it exists to the proportion of 10 per cent., the mischief may be something very serious indeed.

Now I wish to add a few words upon the subject of sulphur determination, although I fear that I am severely taxing your patience from the somewhat tedious nature of many experiments I have been compelled to bring before you. This upright tube corresponds to this one in the apparatus brought down by Mr. Sugg—with which, no doubt, you are thoroughly familiar—and which stands here before you.

I think the best way will be just to show the apparatus as it is put into action when employed to effect a determination of the bisulphide of carbon sulphur always present in coal gas. [Shown.] When it is desired to make a point of ensuring that nothing but the sulphur of the gas shall be condensed in this receiver, I employ the following addition to the apparatus: it is a perforated vessel placed inside this cylinder, containing pieces of pumice stone soaked with some liquid (potassa solution, for instance) capable of absorbing any sulphurous acid of the surrounding atmosphere, so that when this atmosphere is drawn in by the current passing up this trumpet-tube to burn the gas, it, of course, must percolate, so to express it, through the pumice stone in this vessel, and therefore cannot but be so freed from every trace of sulphurous acid, &c., through so much contact with material which is known to very greedily absorb it.

You might say, "How do we quite see, from what you have just observed, that all the air which gets to the burner is freed in that way from sulphurous acid?" My answer to that is, that the lower end of this trumpet-tube being completely immersed in this gutter filled with water or ammonia, renders it perfectly impossible that the least portion of air, except that which passes through the pieces of pumice, can reach contact with the burning gas.

Many of you, gentlemen, may perhaps think I am somewhat bold in my statement when I say, that not only is sulphurous acid produced by the combustion of coal gas, but that sulphuric acid, and nitric acid, are both generated under the usual conditions, when coal gas is burned in common or atmospheric air. Of course, however, the simultaneous production of sulphurous and nitric acids during the combustion of gas is absolutely tantamount to the collateral generation of sulphuric acid.

It is only a week or two since I obtained, under circumstances that would take too long to enter into at this moment, a few condensed drops of oil of vitriol, which had attached themselves to this part [shown] of this condenser,* and I assured myself, as Mr. Valentin did a few months ago in the same regard, that they really were condensed drops of oil of vitriol. It was in examining the gas of one of the Birmingham gas companies—and this gas was remarkably free of any trace of ammonia—that I observed this feature of interest.

I have so often assured myself of the fact that nitric acid is likewise produced during normal combustion, that I want to-night to demonstrate this fact to you, should I be able, in a most distinct and unmistakeable manner. I am sorry you have not gone with me through the whole series of experiments (but that, of course, has been impossible), by which you would at once have seen that there is not the smallest difficulty in demonstrating that nitric acid is always one of the compounds resulting from the combustion of coal gas, no matter whether the coal gas contains ammonia or not.

My opinion is, that where sulphurous acid and sulphuric acid have been so much blamed for the destruction caused to books, furniture, &c., that destructive effect has been and is attributable as much to the production of nitric acid and nitrous acid as to anything else.

I will now make a small experiment in practical chemistry, and I must ask you to bear with me a little while longer, for I am sure the result involved will much interest you. I put, as you see, a little gold-leaf into this test-tube, and I pour upon it some hydrochloric acid. I pour into it, as you may observe, a considerable excess of acid, and I will now proceed to boil it. We shall see no action take place, though I boil it thoroughly; but if I add to it an exceedingly small quantity of some solution containing a nitrate, the gold-leaf will dissolve instantly. Now, I have found in every experiment, in every case—whether we put ammonia round about the burner or not—it is an inevitable circumstance that we get nitrate of ammonium, along with sulphite and sulphate, condensed in this vessel [pointing to the condenser], when we have burned a few cubic feet of gas. To obtain all the nitrogen acid bodies, it is as well, before concentrating the condensed fluid, to add a small portion of pure sodium-hydrate, which safely retains every portion of those acids during the evaporation.

The way in which I afterwards proceed to detect the nitric acid is thus:—When I have treated the nitrite of ammonium and the nitrate of ammonium, &c., contained in the fluid with a little pure caustic soda or caustic potassa, I boil it down cautiously to a very moderate bulk, and filter the solution.

We have only then to proceed by adopting one of the usual methods of detecting nitric acid in nitrates.

Now, to show you this test for nitric acid in nitrates, I first of all again draw your attention to the gold-leaf which we boiled with the hydrochloric acid. We may boil it again without producing the slightest change in it. Now please to note that when I add to the gold-leaf and hydrochloric acid a very few drops of this solution of pure potassium-nitrate, it dissolves immediately. [Experiment performed.] The gold-leaf dissolves because gold is instantaneously attacked by a mixture of nitric and hydrochloric acids, while it is quite unaffected by either singly.

Now, we have a very simple train of reasoning, which we can easily follow, if we put a little of the same hydrochloric acid into this test-tube, with more gold-leaf, test the effect of boiling, as in the last experiment, and then add the solution suspected to contain some nitrate. That we must get a corresponding result, should the fluid contain any, I need scarcely tell you.

It is of importance, in the first place, to boil the gold with the hydrochloric acid, to prove the absence of free chlorine (sometimes found in that acid), which, as it dissolves the metal, would, if it were present, lead to error. Now, I am in the act of putting more gold-leaf into this tube, upon which we will pour, as before, hydrochloric acid, and boil it. I shall add to this some of the concentrated condensed products obtained from burning some gas within this few days, which I believe contains nitric acid, because I have found it in numerous instances under the same circumstances, and then we will compare the action remarked with the first experiment.

Now, we see that there is plenty of gold-leaf apparent in this hydrochloric acid, which has been boiled and allowed to cool. I will, therefore, add this portion of the concentrated burnt product to it, and agitate the whole. [Experiment performed.] I can see that the gold-leaf, even without the application of heat, is beginning to disappear. It will dissolve instantly by warming the tube of solution over this flame. [Experiment shown.]

Well, gentlemen, it only remains for me now to thank you most sincerely for the patience with which you have listened to me. I hardly like to repeat the statement that it has been extremely difficult for me to bring before you to-night such new matter as could be readily appreciated in the form of a lecture; but I think that, when I sum up what I have endeavoured to demonstrate before you to-night, you will credit me with the best intentions, if you feel unable to accord me your full praise for telling experimental precision, together with brilliancy of demonstration. I do not think any one can say otherwise than this, as a deduction from one new feature brought before you—*i. e.*, that hydrogen and carbonic oxide have been classed together improperly as non-illuminants. We know now that carbonic oxide hinders illuminating power; it detracts from the illuminants, while hydrogen does not. I have endeavoured to demonstrate this to-night, and I think I have succeeded fully in that task.

I proposed also to show you that nitric acid is really one of the burning products of the combustion of coal gas—that we can detect it when we collect it in this vessel; and I hope, gentlemen, the efforts I have made to furnish you with something instructive, combined with something interesting, have not been without their end this evening. I had nearly omitted to say that if any gentleman would like to ask any questions, I shall be happy to answer them; and once more I beg to thank you for your attention to what I have brought under your notice this evening.

Mr. NEWALL: You have shown us the presence of carbonic oxide in gas, would it be too much to ask you to show the best and cheapest mode of taking it out of gas upon a large scale?

Mr. ANDERSON: I do not know of any other method which will effectually accomplish this, except the use of the subchloride of copper.

Mr. NEWALL: Would that be an expensive process?

Mr. ANDERSON: No; for this reason, that the metal it contains would suffer no deterioration. The copper would be of the same intrinsic value after use as it was before; but I could give no idea of the cost of the process. I am simply a chemist, and have no experience in engineering matters; and if I had any opinion on the subject of cost, I should be chary to mention it in the presence of gentlemen so well able to judge for themselves in that regard.

Mr. NEWALL: Can we extract the nitric acid from the gas, so that it cannot be evolved in combustion?

Mr. ANDERSON: That I can give an unqualified opinion upon. Unfortunately the small amount of nitric acid produced in gas burning, arises entirely from its combustion in conjunction with the nitrogen and oxygen of the atmosphere. While burning in contact with these two, you have nitric acid produced as the result of oxidation. The gas, as it is sent out from the works, contains nothing of the kind; it is simply impossible that gas can contain it. Nitric acid is a product of the burned gas, which does not exist there before its combustion.

Mr. BRADDOCK: Allow me to ask whether nitric acid is a production of other inflammable bodies as well as of gas.

Mr. ANDERSON: I should say undoubtedly it is. I should fully expect to find it generated from the combustion of an oil lamp or a candle. What I have stated just now, in reply to Mr. Newall, would show that, I think, pretty clearly.

On the motion of the PRESIDENT, a vote of thanks was given to Mr. Anderson for his lecture, and the same having been briefly acknowledged, the proceedings of the day closed.

* The condenser employed according to the plan shown this evening of Mr. Sugg's.

THE THAMES.—The Conservators of the River Thames, in their report for last year, just published, say that the condition of the river near the main drainage outfalls, at Barking and Crossness, has continued to receive their anxious attention. Repeated surveys having convinced them that shoals have been created by the deposit from these outfalls, the conservators made a formal complaint to the Secretary of State for the Home Department, and although no further decrease of the depth of water or actual impediment to the navigation has yet been caused, the conservators find that the deposited matter now spreads over an increasingly extensive area of the bed of the river, and this fact must be regarded with considerable apprehension as to the results. The conservators feel it to be their duty to remark that a considerable portion of the sewage of the metropolis north of the Thames still continues to pass into the river between Chelsea and the Isle of Dogs. The extension of the system of steam towing has made it obvious that the obstructions to the navigation, caused by Battersea and Fulham Bridges, ought no longer to be permitted. Without the authority of Parliament no effectual improvement can be made, and that authority will therefore be sought in the ensuing session. The conservators have not, they say, omitted any opportunity for improving the condition of the water. They have given the requisite notices to discontinue passing sewage and refuse into the river. In many cases the discharge has been stopped, and in many others non-compliance has arisen from the uncertainty as to the best mode of disposing of the sewage. In nearly every case the local authorities and others have now decided to adopt some practical scheme, so that in a short time the conservators hope they may be able to announce that sewage and other impurities no longer pass into the river westward of the metropolis. A scheme has been approved for the better drainage of the country near Oxford, by deepening and altering the channel of the river, but the conservators find it will be necessary to obtain parliamentary powers to enable them to carry it out satisfactorily.

PRESENTATION TO MR. PRITCHARD, OF ST. HELEN'S GAS-WORKS.—Mr. William Pritchard, manager of the St. Helen's Gas-Works, has been presented by the shareholders and directors of the gas company with a gold watch, value 30 guineas, "as a mark of their appreciation of his attention, zeal, and success in the improved status of the gas-works generally." The presentation was made by John Ansdell, Esq., chairman of the company, and suitably acknowledged by Mr. Pritchard.

DR. FRANKLAND'S ANALYSIS OF THE METROPOLITAN WATERS IN JULY, 1869.—"Royal College of Chemistry, July 28, 1869.—Sir,—I have the honour to submit to you in the following table the results of the chemical examination of the waters supplied to the metropolis during the month of July. For the purpose of comparison I append also the results yielded by the waters supplied to the towns of Edinburgh, Newcastle, Glasgow, Manchester, Preston, Lancaster, Bristol, Dublin, and Norwich, and by samples of Thames water taken at London Bridge at low and high water; also by the well waters from the artesian well in Trafalgar Square, from the Royal Mint, and from Barclay's Brewery. The samples drawn from the mains of all the companies were clear, with the exception of those supplied by the Grand Junction and East London Companies, which were slightly turbid. The suspended matter of the Grand Junction Company's water contained living organisms. The mean temperature of the river waters as delivered to consumers was 16·3° Cent. (61·3° Fahr.), which is 3·7° Cent. (6·7° Fahr.) lower than in July, 1868. The Kent Company's water was delivered much cooler, the temperature being only 13·3° Cent. (55·9° Fahr.). Such is the temperature of water *as delivered by the companies*, but, owing to the storeage in cisterns necessitated by the intermittent system of delivery, the water *as used by consumers* is much warmer at this period of the year. Thus, on the 27th inst., at eleven p.m., the temperature of the New River Company's water, in a cistern placed in the basement of a house, was 20° Cent. (68° Fahr.), whilst in a cistern placed beneath the roof it was 21·1° Cent. (70° Fahr.) At these last temperatures water tastes vapid and unrefreshing

Companies.	Date and Place of Collection.	Temperature in Centigrade Degrees.	Total Solid Impurity.	Organic Carbon.	Organic Nitrogen.	Ammonia.	Nitrogen, as Nitrates and Nitrites.	Total combined Nitrogen.	Previous Sewage Contamination (Estimated).	Chlorine.	Total Hardness.
Thames.											
Chelsea.....	July 2 — Cab Rank, Horse Guards.....	16·1	24·7	·116	·016	·001	·177	·194	1460	1·60	20·3
West Middlesex	July 2 — Cab Rank, Portland Road..	16·7	25·5	·116	·024	·000	·172	·196	1400	1·64	20·3
Southwark & Vauxhall..	July 2 — Cab Rank, Saint George's Ch.	17·2	25·2	·138	·024	·001	·112	·137	810	1·63	20·8
Grand Junction.....	July 2 — Cab Rank, Woodstock Street.	16·1	25·8	·161	·026	·002	·122	·150	920	1·62	20·6
Lambeth....	July 2 — Cab Rank, Lambeth Road..	16·1	25·1	·126	·025	·002	·186	·213	1560	1·69	20·3
Other Sources											
New River...	July 2 — Cab Rk., Tottenham Ct. Rd.	16·4	27·1	·058	·017	·000	·220	·237	1880	1·56	21·2
East London.	July 3— Slater's, Old Ford Road .	15·8	22·2	·046	·028	·000	·150	·178	1180	1·77	18·8
Kent.....	July 3—Deptford Bridge Police Statn.	13·3	40·2	·042	·009	·000	·378	·387	3460	2·40	30·9
Edinburgh Waters.											
Crawley Burn	Sept., 1868.		11·28	·187	·031	·001	·000	·032	0	1·042	6·1
Comiston Wr.			22·58	·085	·017	·001	·744	·762	7124	1·886	10·4
Swanston Wr.			12·70	·378	·059	·001	·000	·060	0	1·390	6·2
Colinton Wr.			14·10	·203	·042	·000	·000	·042	0	0·894	9·2
Newcastle...	September ..		23·40	·237	·062	·000	·000	·062	0	1·588	13·9
Loch Katrine	July, Glasgow		3·00	·161	·011	·001	·000	·012	0	·905	0·3
Manchester..	June.....		6·20	·183	·009	·006	·025	·039	0	1·117	3·7
Preston	August.....		12·44	·236	·031	·006	·000	·036	0	1·590	8·9
Lancaster ...	November...		4·58	·129	·022	·001	·000	·023	0	·993	·87
Bristol.....	Feb., 1869 — Water-Works		28·66	·160	·017	·001	·203	·221	1720	1·3	24·46
Dublin	April, 1869 — Water supply		6·34	·238	·024	·001	·000	·025	0	1·24	2·97
Norwich.....	Sept., 1868— Norwich w. s.		28·18	·227	·055	·000	·000	·055	0	2·631	23·68
Thames water filtered....	April 27, 1869, Lond. Bridge, mid-stream										
	at low water		30·35	·455	·075	·032	·181	·282	1750	1·95	22·7
	at high watr		92·85	·540	·122	·025	·394	·537	3830	31·5	23·9
Artesian well water	May 6, 1869— Trafalgar Sq.		83·4	·150	·012	·070	·000	·070	260	16·55	5·92
Deep Chalk well water.	June, 1869— Royal Mint.		83·96	·195	·025	·060	·000	·074	170	13·92	17·48
Deep well wr.	July, 1869— Barclay's B.	12·1	73·3	·085	·008	·060	·000	·057	170	14·08	7·33
Column 1	2	3	4	5	6	7	8	9	10	11	12

The numbers in columns 4, 5, 6, 7, 8, 9, 10, 11, and 12 all relate to 100,000 parts of the waters. The table is to be read thus: The Chelsea Company's water collected on the 2nd of July, at the Horse Guards cab rank, had a temperature of 16·1° Cent.; 100,000 lbs. of it contained 24·7 lbs. of solid impurity; the organic matter, constituting a portion of this impurity, contained ·116 lb. of carbon and ·016 lb. of nitrogen. This solid impurity also contained ·177 lb. of nitrogen in the form of nitrates and nitrites, besides ·001 lb. of ammonia, whilst the total amount of *combined* nitrogen in every form was ·194 lb. The above quantity of water supplied by the Chelsea Company had been, after its descent to the earth as rain, contaminated with sewage or manure matter equivalent to 1460 lbs. of average filtered London sewage. By gradual oxidation, partly in the pores of the soil, partly in the Thames and its tributaries, and partly in the reservoirs, filters, and conduits of the company, this sewage contamination had been converted into innocuous inorganic compounds before its delivery to consumers. The above quantity of water also contained 1·60 lb. of chlorine. Finally, 100,000 lbs. of the Chelsea Company's water contained 20·3 lbs. of carbonate of lime, or an equivalent quantity of other soap-destroying ingredients.—I have, &c., E. FRANKLAND.—The Registrar-General, &c."

Register of New Patents.

2667.—WILLIAM STRANG, of Glasgow, in the co. of Lanark, N.B., for "*Improvements in arrangements and apparatus for dealing with sewage.*" Patent dated Aug. 28, 1868.

According to this invention a vessel is provided, at the lower end of a discharge-pipe, with separate outlets for the liquids and solids combined, and there is interposed therein a filtering or separating medium of sufficient depth through which the liquids can pass, but which keeps back the solids.

2699.—FREDERIC HUDSON, of 227, Blackfriars Road, in the co. of Surrey, manufacturer of gas-meters, for "*Improvements in dry gas or liquid meters.*" Provisional protection only obtained. Dated Sept. 1, 1868.

This invention relates to an improved diaphragm, consisting of a central disc, surrounded by outer discs attached to leather, so that the diaphragm is allowed to work freely backwards and forwards. By this combination a perfect shape is maintained at each vibration, which perfects the registration of the meter.

2702.—THOMAS GEORGE FONNEREAU DOLBY, of 14, Old Town, Clapham, in the co. of Surrey, manufacturing goldsmith, for "*Improvements in the application and construction of valves made of india-rubber or other similarly elastic material.*" Patent dated Sept. 1, 1868.

This invention relates to the particular formation of valve described by the patentee in the specification of his patent No. 192, Jan. 20, 1868, and consists in the application of such valves to various other useful purposes, amongst others to air-pumps, air-exhausters, pumps, filters, &c. The most convenient mode of applying these is to fit them in metal, and apply a metallic seating to them. This seating may be perforated or in the form of bars or any other suitable form, according to the purposes for which it is to be used.

2727.—THOMAS BUTTERWORTH, of 18, Mumps, Oldham, in the co. of Lancaster, engineer, for "*An improved pump suitable for lubricating and for other purposes.*" Patent dated Sept. 4, 1868.

This improved pump consists of an ordinary barrel and plunger, but, instead of the ordinary suction and delivery valves, a revolving valve or tap is employed, which is so constructed that as it revolves it alternately opens and shuts a communication between the pump-barrel and suction-pipe, and between the pump-barrel and delivery-pipe. The valve or tap is provided with three branches, one of which is connected to the suction-pipe, one to the pump-barrel, and one to the delivery-pipe, and a passage is cut in the revolving plug so as to open a communication between the pump-barrel and the suction-pipe and delivery-pipe alternately.

2745.—WILLIAM TATLOCK, of Frankfort, Germany, civil engineer, and CHRISTOPHER NICOLAY ABELSETH, of Philadelphia, Pennsylvania, U.S.A., civil engineer, both now of 8, Southampton Buildings, Chancery Lane, in the co. of Middlesex, for "*Improvements in apparatus for manufacturing gas.*" A communication. Provisional protection only obtained. Dated Sept. 5, 1868.

This invention consists in a peculiar construction of gas generator, through which a continuous current of atmospheric air is forced, all of such air being brought into contact with the liquid with which the generator is charged, and thereby impregnated with the inflammable matter contained in the same. In the centre of a tank is placed a perforated pipe or hollow shaft, which, where it passes through the head or end of the tank, is provided with a stuffing-box made in the usual way to allow the shaft to revolve freely in the tank without leaking. Upon this shaft, inside the tank, is placed a perforated cylinder, made less in diameter than the tank, to leave a space around it and between it and the tank; outside of this cylinder another cylinder is fitted, which is also perforated, a slight space being left between the two cylinders. This space is filled with cotton batting or other suitable material.

2753.—GEORGE DAVIES, of 1, Serle Street, Lincoln's Inn, in the co. of Middlesex, and 87, St. Vincent Street, in the city of Glasgow, civil engineer and patent agent, for "*An improved meter for water or other incompressible fluid.*" A communication. Patent dated Sept. 7, 1868.

This improved meter consists mainly of two cylinders, which serve as measures of capacity, and two distributing cylinders, all placed in juxtaposition and parallel to each other, beneath a crank-shaft, by means of which the four connecting-rods for working the pistons and distributing valves are actuated.

2780.—ALFRED VINCENT NEWTON, of 66, Chancery Lane, in the co. of Middlesex, mechanical draughtsman, for "*An improvement in pumps.*" A communication. Patent dated Sept. 9, 1868.

This improvement consists in the construction of a hollow piston, having side openings in it, and double-acting disc or puppet valves, carried by the piston and seating alternately on or over apertures in the ends of the piston.

2808.—GEORGE BOWER, of St. Neots, in the co. of Huntingdon, gas and water work engineer, and WILLIAM HOLLINSHEAD, of the same place, engineer, for "*Improvements in gas-engines.*" Patent dated Sept. 11, 1868.

The engine consists of a framework carrying two cylinders placed diagonally, and at right angles to each other; these cylinders are arranged so as to oscillate on hollow trunnions, and both piston-rods are attached to the same crank-pin. On one side of each cylinder, and having the axis of oscillation passing through it, there is fitted a valve-box with a cover and slide-valve, and on the face of the cover of the valve-box there is attached the hollow trunnion. The trunnion on the opposite side of the cylinder is attached direct to it. Each cylinder is provided with a jacket or outer case for the purpose of passing a stream of water round it to keep it cool.

Within the hollow trunnions are fitted internal tubes or casings having compartments arranged in them; these internal tubes or casings are turned to fit accurately and truly the interior of the trunnions, which are also bored out. The internal casings are held in position by a bracket and set-screw bolted on to the framework of the engine, thus preventing them from oscillating or vibrating with the trunnions and cylinders. The explosion of the mixture of gas and air is effected at one end of each cylinder, only the down-stroke being performed by the pressure of the atmosphere acting on a partial vacuum produced under the piston by the exploded gases.

APPLICATIONS FOR LETTERS PATENT.

2309.—THOMAS RAMSAY, of Sherburn Tower, Gateshead, in the co. of Durham, gentleman, for "*Improvements in apparatus for the manufacture of gas.*" July 31, 1869.

2313.—PAUL RAPSEY HODGE, of 10, Adam Street, Adelphi, in the parish of St. Martin's-in-the-Fields, in the co. of Middlesex, civil engineer, for "*Certain improvements in the manufacture of luminous and heating gas from hydrocarbonaceous fluids, and in the methods of using and applying such gas for illuminating and heating purposes.*" Aug. 2, 1869.

2318.—MICHAEL HENRY, of 68, Fleet Street, in the City of London, patent agent, for "*Improvements in apparatus for ventilating mines, drains, and other places, and extracting noxious gases, smoke, and vapours therefrom; such apparatus being also applicable for communicating sound.*" A communication. Aug. 2, 1869.

2319.—JAMES PINCHBECK, of Whiskin Street, Clerkenwell, in the co. of Middlesex, for "*Improvements in gas-meters.*" Aug. 3, 1869.

2323.—ALEXANDER LOUDEN, of Ceres, in the co. of Fife, N.B., for "*Improvements in taps or cocks used for drawing off water and other liquids from casks or other vessels.*" Aug. 3, 1869.

2327.—JOHN THOMAS WAY, of 9, Russell Road, Kensington, in the co. of Middlesex, for "*Improvements in the manufacture of manures and in the purification of gas.*" Aug. 3, 1869.

2330.—ISAIAH DAVIES, of Harborne, in the co. of Stafford, mechanical engineer, for "*Improvements in rotary gas-exhausters.*" Aug. 3, 1869.

2346.—BENJAMIN JOSEPH BARNARD MILLS, of 35, Southampton Buildings, in the co. of Middlesex, patent agent, for "*Improvements in meters for measuring liquids and gases.*" A communication. Aug. 5, 1869.

2354.—WILLIAM ROBERT LAKE, of 8, Southampton Buildings, London, consulting engineer, for "*Improvements in devices for holding the chimneys of gas-burners and other lighting apparatus.*" A communication. Aug. 6, 1869.

2395.—SAMUEL JOSEPH WOODHOUSE, of Holbeck, Leeds, in the co. of York, gas inspector, for "*Improved apparatus for purifying and regulating the supply of gas to burners, and also for an improved standard tap.*" Aug. 10, 1869.

2414.—WILLIAM EDWARD NEWTON, of 66, Chancery Lane, in the co. of Middlesex, civil engineer, for "*Improvements in centrifugal pumps.*" A communication. Aug. 12, 1869.

2416.—WILLIAM ROBERT LAKE, of 8, Southampton Buildings, London, consulting engineer, for "*Improvements in machinery for charging gas-retorts.*" A communication. (Complete specification.) Aug. 12, 1869.

GRANTS OF PROVISIONAL PROTECTION.

2153.—ALEXANDER ROLLASON, of 123, Pembroke Road, in the parish of Clifton, in the city and co. of Bristol, chemist, for "*Improvements in the mode of extracting ammonia, purifying gas liquor, and utilizing the same.*" July 16, 1869.

2203.—JOHN OGDEN, of Manchester, in the co. of Lancaster, mechanic, for "*A combined tap and filter for water and other liquids.*" July 21, 1869.

2233.—THOMAS BARNES, of Whitehaven, in the co. of Cumberland, merchant, for "*Improvements in the treatment of coal for the removal of the sulphur compounds contained therein.*" July 22, 1869.

2240.—JOHN HENRY JOHNSON, of 47, Lincoln's Inn Fields, in the co. of Middlesex, gentleman, for "*Improvements in the joints of pipes and tubes.*" A communication. July 23, 1869.

2264.—BRISTOW HUNT, of 1, Serle Street, Lincoln's Inn, in the co. of Middlesex, gentleman, for "*Improvements in valves.*" A communication. July 26, 1869.

2277.—DANIEL THOMAS BOSTEL, of 21, Ship Street, Brighton, in the co. of Sussex, plumber, for "*Improvements in what are known as dry earth-closets.*" July 27, 1869.

2309.—THOMAS RAMSAY, of Sherburn Tower, Gateshead, in the co. of Durham, gentleman, for "*Improvements in apparatus for the manufacture of gas.*" July 31, 1869.

2319.—JAMES PINCHBECK, of Whiskin Street, Clerkenwell, in the co. of Middlesex, for "*Improvements in gas-meters.*" Aug. 3, 1869.

2323.—ALEXANDER LOUDEN, of Ceres, in the co. of Fife, N.B., for "*Improvements in taps or cocks used for drawing off water and other liquids from casks or other vessels.*" Aug. 3, 1869.

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2330.—ISAIAH DAVIES, of Harborne, in the co. of Stafford, mechanical engineer, for "*Improvements in rotary gas-exhausters.*" Aug. 3, 1869.

2346.—BENJAMIN JOSEPH BARNARD MILLS, of 35, Southampton Buildings, in the co. of Middlesex, patent agent, for "*Improvements in meters for measuring liquids and gases.*" A communication. Aug. 5, 1869.

NOTICES TO PROCEED.

815.—JAMES CARTER, of the town and co. of the town of Nottingham, gentleman, for "*Improvements in disinfecting and deodorizing fæcal and excremental matters, and in obtaining manure.*" March 17, 1869.

967.—AUGUSTUS FRASER BAIRD, of Pimlico, in the co. of Middlesex, lieutenant-colonel in the Bengal Staff Corps, for "*Improvements in earth-closets and urinals.*" March 31, 1869.

982.—JOSEPH CALDWELL LEE, of Ashton-on-Mersey, in the co. of Chester, chemist, for "*Certain methods of collecting excreta, and of treating the same in order to render them comparatively innocuous, and to obtain a useful product or useful products therefrom.*" April 1, 1869.

1088.—ALFRED VINCENT NEWTON, of 66, Chancery Lane, in the co. of Middlesex, mechanical draughtsman, for "*Improvements in rotary engines, pumps, and meters.*" A communication. April 9, 1869.

1102.—DAVID BRUCE PEEBLES, of Edinburgh, in the co. of Mid Lothian, N.B., engineer and gas-meter manufacturer, for "*Improvements in gas-meters.*" April 10, 1869.

1316.—JULIUS FRÖLICH, of 2, Park Villas, Lonsdale Road, Barnes, in the co. of Surrey, for "*Improvements in apparatus for generating gas to be used in gas-furnaces.*" April 28, 1869.

1973.—ROBERT HEYWORTH, of the city of Manchester, in the co. of Lancaster, plumber, for "*Improvements in water-closets, wash-basins, and urinals, and in self-acting apparatus for the same.*" June 30, 1869.

2052.—ALFRED VINCENT NEWTON, of 66, Chancery Lane, in the co. of Middlesex, mechanical draughtsman, for "*Improvements in the construction of chandeliers.*" A communication. July 7, 1869.

PATENT WHICH HAS BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £100 BEFORE THE EXPIRATION OF THE SEVENTH YEAR.

2206.—WILLIAM GEORGE VALENTIN and FREDERICK LEVICK, "*Improvements in the generation of combustible gases for lighting and heating purposes, and in the mode of applying such gases to the manufacture of iron, glass, and other processes in the arts where great heat is required.*" Aug. 6, 1862.

Share List of Metropolitan Gas Companies.

Number of Shares issued.	Amount per Share.	Name of Company.	Amount paid up p. Share.	Dividend p. Cent. p. Annum.	Price per Share.
	£		£ s. d.	£ s. d.	£
8000	10	Anglo-Romano	10 0 0	10 0 0	11 — 12
5000	20	Bahia (Limited)	20 0 0	3 0 0	13 — 14
1000	20	Do., preference	20 0 0	10 0 0	24 — 25
750	20	Do., do., redeemable	20 0 0	10 0 0	20 — 22
40000	5	Bombay (Limited)	5 0 0	4 0 0	4¼ — 4½
10000	5	Do., third issue	4 0 0	4 0 0	3¼ — 3⅝
10000	20	British (Limited) (Norwich, Hull-Sculcoates, Hanley, Tunstall & Shelton [Potteries], Trowbridge, & Holywell.)	20 0 0	10 0 0	30 — 31
12000	50	*Chartered*	50 0 0	4 5 0	46 — 46½
6060	50	Do.	45 0 0	4 5 0	41 — 41⅝
10000	20	*City of London*, A shares	20 0 0	8 0 0	23 — 24
10000	10	Do., B shares	10 0 0	4 0 0	6¾ — 7
9629	10	Do., new shares	10 0 0	8 0 0	11 — 12
17490	25	*Commercial*	25 0 0	10 0 0	35 — 36
20000	20	Continental Union	20 0 0	5 0 0	24 — 24½
5213	20	Do., preference	20 0 0	7 0 0	23 — ..
5000	10	*Crystal Palace District*	10 0 0	10 0 0	13½ — 14
5000	10	Do., preference	10 0 0	6 0 0	12½ — 13
10000	10	Do., new shares	10 0 0	7 0 0	10⅝ — 11
4000	50	*Equitable*	50 0 0	10 0 0	68 — ..
4000	25	Do., new shares	25 0 0	10 0 0	32½ — 33
23406	10	European (Limited)	10 0 0	11 0 0	15 — 15⅝
12000	10	Do., new shares (Boulogne, Amiens, Rouen, Caen, Havre, & Nantes.)	5 0 0	11 0 0	7½ — 7⅝
20000	10	*Great Central Gas Consumers*	10 0 0	..	11½ — 11⅞
5000	10	Hong Kong (Limited)	10 0 0	6 0 0	8 — 10
26000	50	*Imperial*	50 0 0	10 0 0	70 — 70½
26000	10	Do., new shares	4 0 0	10 0 0	6⅞ — 7
26000	12½	Do., new shares	12 10 0	7 0 0	13 — 13½
1300	100	Do., bonds	£100	10 0 0	175 — 180
28000	50	*Imperial Continental* (Amsterdam, Berlin, Ghent, Hanover, Lille, Rotterdam, Aix-la-Chapelle, Antwerp, Bordeaux, Brussels, Cologne, Frankfort-on-Maine, Haarlem, Stolberg, Toulouse, & Vienna.)	43 15 0	16 0 0	115 — 115½

Number of Shares issued.	Amount per Share.	Name of Company.	Amount paid up p. Share.	Dividend p. Cent. p. Annum.	Price per Share.
	£		£ s. d.	£ s. d.	£
400	100	Imperial Mexican (Limited)	100 0 0	nil.	
200	100	Do., new	100 0 0	nil.	
3000	40	*Independent*	40 0 0	10 0 0	51 — 53
3000	10	Do.	10 0 0	5 0 0	7 — 8
3000	20	Do.	15 0 0	7 10 0	15 — 16
7133	50	*London*	50 0 0	10 0 0	66 — 68
5610	25	Do., 1st preference	25 0 0	6 0 0	26 — 28
503	50	Do., 2nd preference	50 0 0	6 0 0	
214	50	Do., 3rd preference	50 0 0	6 0 0	
£18781		Do., 1st preference stock		6 0 0	
£11828		Do., 2nd preference stock		5 0 0	
		Nictheroy, Brazil (Limited)			
15000	5	Malta and Mediterranean (Limited)	5 0 0	3 10 0	3½ — 4
6000	5	Do., preference	5 0 0	7 0 0	4¾ — 5¼
30000	5	Oriental (Calcutta)	5 0 0	10 0 0	7⅛ — 8
30000	5	Do., new shares	1 0 0	10 0 0	1⅜ — 1½
10000	5	Ottoman (Limited)	5 0 0	nil.	1⅝ — 2¼
12500	10	Park (Limited)	10 0 0	7 10 0	8½ — 9
27000	20	*Phœnix*	20 0 0	10 0 0	26½ — 27
3600	100	Do., new	35 0 0	7 10 0	36 — 36½
144000	Sk.	Do.	100 0 0	5 0 0	73¼ — 74½
5000	20	*Ratcliff*	20 0 0	10 0 0	23 — 24
	20	Rio de Janeiro (Limited)	20 0 0	10 0 0	24¼ — ..
6959	5	Singapore (Limited)	5 0 0	4 0 0	
2000	5	Do., preference	5 0 0	7 10 0	
		Shanghai			
4800	50	*South Metropolitan*	50 0 0	10 0 0	73 — 75
4800	12½	Do., new shares	12 10 0	10 0 0	18¼ — 19
15000	10	*Surrey Consumers*	10 0 0	10 0 0	13¼ — 13⅝
10000	10	Do., new	6 0 0	10 0 0	8 — 8½
9000	4	United General (Limerick)	4 0 0	5 0 0	2 — 2½
10000	10	*Victoria Docks*	5 0 0	6 0 0	
1500	10	*Wandsworth and Putney*	10 0 0	10 0 0	10 — 12
1500	10	Do.	10 0 0	7 10 0	
1819	10	Do.	10 0 0	7 10 0	
1138	10	Do.	5 0 0	7 10 0	
20000	10	Western (Limited) A shares	10 0 0	10 0 0	15⅜ — ..
10000	10	Do., B shares	7 0 0	10 0 0	9¼ — 10
10000	10	Do., C shares	7 0 0	10 0 0	9½ — 10
20000	10	Do., D shares	1 0 0	10 0 0	1⅝ — 2
8000	5	*West Ham*	7 0 0	7 10 0	7⅛ — 7¼
6000	5	Do., new shares	7 0 0	7 10 0	
551	10	West London Junction (Limited)	10 0 0	6 0 0	
520	10	Do., preference	10 0 0	6 0 0	

THE ALUM AND AMMONIA COMPANY, LIMITED.

NOTICE is hereby given, that the TENTH HALF-YEARLY ORDINARY MEETING of the Shareholders of this Company will be held at the Works, Bow Common, on FRIDAY, the 27th of August, at Twelve o'clock at noon precisely.

By order of the Board,
THOS. GUYATT, Secretary.

15, Coleman Street, City,
London, Aug. 17, 1869.

SURPLUS PLANT FOR SALE.

THE Directors of the Newry Gas

Consumers Company, Limited, have for Sale the following, viz.:—A GASHOLDER, 30 ft. by 12 ft., with columns, &c.; three lengths of 14-in. D Hydraulic Main; two Condenser Boxes for 8-in. stand-pipes; an Exhauster capable of passing about 5000 cubic feet per hour; and a Boiler, 14 ft. long by 2 feet 6 in. diameter. All have been removed to make room for larger apparatus.

For further particulars, apply to the Company's Manager, at the Works, Kilmovey Street.

By order,
JOHN M'MILLAN, Manager.

GLASGOW CORPORATION GAS.

MANAGER AND ENGINEER WANTED.

THE Corporation of Glasgow are

prepared to receive APPLICATIONS for the situation of MANAGER and ENGINEER of their gas-works. There are four works, and the present consumption of cannel is about 130,000 tons per annum. The salary will be not less than £700 per annum.

Applications, with copies of testimonials, may be lodged with the Town-Clerks, City Chambers, Mr. Monro's Office, on or before the 1st of September.

City Chambers, Glasgow, Aug. 5, 1869.

TO GAS COMPANIES, ENGINEERS, &c.

FOR SALE, at £4 per ton, 9 Cast

COLUMNS, 42 ft. 7 in. long, with foundation plates, girders, weights, brackets, pulleys, &c. Suitable for a 48-ft. telescopic treble-lift gasholder.

Apply to W. C. ABELL AND CO., Waggon Works, WORCESTER.

FOR SALE, a cast-iron Purifier, 6 ft.

by 3 ft. 6 in., with wrought-iron cover, four tiers of wood sieves, and two 5-in. slide-valves, all in good condition, being replaced by larger.

For further particulars, apply to THOS. SIMPSON, Gas-Works, DAVENTRY.

LONDON AND NORTH-WESTERN AND GREAT WESTERN RAILWAYS (JOINT LINES).

FOR SALE, a Set of Three Cast-Iron

GAS PURIFIERS, 3 ft. 6 in. diameter by 3 ft. 4-in. deep, with hydraulic centre-valve for 4-in. connexions. May be seen on application to Mr. Bullock, at the Chester Railway Station Gas-Works.

Tenders, sealed and properly endorsed, to be sent to the undersigned on or before the 1st of September next.

J. WAIT, Secretary.

Birkenhead, Aug. 2, 1869.

PURIFIERS FOR SALE.

A Set of Four Cast-Iron Purifiers, 8 ft.

square, with wrought-iron lids, wrought-iron centre-valve in cast-iron case, wood sieves, connecting-pipes, and lifting apparatus complete, and nearly new.

If preferred, Cockey's patent centre-valve, or cast-iron sieves, in place of above.

For particulars, apply to G. PORTER, Manager, Gas and Water-Works, CARLISLE.

TO GAS COMPANIES, CHEMICAL MANUFACTURERS, AND OTHERS.

TO BE SOLD, in One Lot or otherwise,

in consequence of alterations, FORTY-SEVEN VATS. They are of the best construction, and in good condition. Memel oak. Varying in contents from 6500 up to 50,000 gallons each.

Further particulars may be obtained of F. O. SMITHERS, Esq., 17, Great Tower Street, LONDON, E.C.

TO BE SOLD, a 6-in. Governor, bye-

pass valves, &c., complete; 40 ft. various lengths D Hydraulic Main, 13 in. by 12 in.; a lot of Circular Mouthpieces; Ascension, Bridge, and Dip Pipes.

Apply to A. C. FRASER, Gas-Works, COLCHESTER.

TO GAS ENGINEERS, &c.

A Gas Engineering, Gas-Fitting, and

Hydraulic Engineering Business to be DISPOSED OF, in consequence of the failing health of the proprietor. A capital opening for an enterprising man with a small capital.

For particulars apply to H. B., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

CHEPSTOW, MONMOUTHSHIRE.

WANTED, by the Chepstow Gas and

Coke Consumers Company, a SECRETARY and MANAGER who thoroughly understands the manufacture of gas and the keeping of gas accounts. A person practically acquainted with the erection and maintenance of gas-fittings will be preferred. Quantity of gas made in the year 5,000,000 cubic feet. Salary £80 per annum. Security in £200 to be given.

Applications, with testimonials, to be forwarded, addressed to the CHAIRMAN of the Chepstow Gas and Coke Consumers Company, Bank Buildings, Chepstow, before the 28th inst.

Chepstow, Aug. 9, 1869.

THE

WORTHING GASLIGHT AND COKE COMPANY.

(Incorporated by Special Act of Parliament, 31 and 32 Vict., c. 92.)

New Capital, £12,750, in 1275 Shares of £10 each. (With Power to Borrow.)

First issue, 650 shares of £10 each, £6500; £1 per share payable upon application; £1 per share payable on allotment. First call, £2 per share, payable one calendar month after allotment; and second call, £1 per share, payable three calendar months after the first call.

It is anticipated that no further call will be made for some time.

DIRECTORS.

The Directors of the old Company are appointed by the Act of Parliament the Directors of the Incorporated Company for the first year, and are—

Mr. Charles Cortis, South Street, Worthing, Chairman.
Alexander Randall, Esq., Banker, Maidstone.
Henry Harris, Esq., 126, Leadenhall Street, London, and Sussex Villa, Streatham.
Mr. Edmund Lephard, Heene.
Mr. Charles Hide, jun., Worthing.
Mr. Frederick Blaker, Worthing.
Mr. W. Purvis, Croydon, Chairman of the Carshalton Gas Company.

BANKERS.

Messrs. Henty and Son, Worthing.
(London Agents: Messrs. Robarts, Lubbock, & Co.)

SOLICITOR.

Mr. Wm. Hugh Dennett, 5, Bedford Row, Worthing.

ENGINEER.

Mr. Horatio Brothers, London.

SECRETARY.

Mr. Frederick Patching, Warwick Street, Worthing.

PROSPECTUS.

The Old Worthing Gaslight and Coke Company was established between 30 and 40 years ago, under a Deed of Settlement.

The Act of Parliament which was obtained last year for incorporating the new Company, comprises within its limits the district of Worthing, and the parishes of Broadwater, Heene, and West Tarring.

It was proved in evidence before the Committee of the House of Commons, that in the year ending the 30th of June, 1863, the quantity of gas made at the works was 9,047,700 cubic feet; and that in the year ending the 30th of June, 1867, this quantity had increased to 15,529,700 cubic feet.

It was also proved before the same committee that the average annual increase in the consumption of gas between the before-mentioned periods had been 12·8 per cent., and that the aggregate increase of consumption had been about 70 per cent.

When the gas-works were first established in 1834, the price of gas charged to private consumers was 12s. 6d. per 1000 cubic feet; this price was reduced from time to time, and finally, in 1863, fixed at 6s. 3d. per 1000 cubic feet: thus it will be seen that in spite of this high price, the increase in the consumption of gas during the last six years has been uninterruptedly and largely progressive; and it cannot be doubted that with the price reduced to 5s. per 1000 cubic feet (which is the maximum price fixed by the Act of Parliament), a very large increase in the consumption of gas will immediately follow. Indeed, this rapid increase in the demand for gas lighting almost alone necessitated the application to Parliament for the increased powers which were granted last year, for the old works had become insufficient, more especially for the storeage of the gas required for the town, and which entailed great loss in carrying on the works.

The Incorporated Company have obtained a piece of land immediately contiguous to the present gas-works, which will enable them to carry on the works more economically than the lessees have recently been able to do, and will give the Company ample storeage room.

All these circumstances induce the Directors to believe that the shares in the new Company will be a very secure and profitable investment.

Prospectuses and forms of application for shares may be obtained at the Bankers, Solicitor, and Secretary.

If no allotment is made the deposit will be returned in full.

CONTRACT FOR IRON ROOF.

THE Directors of the Rugby Gas and

Coke Company are prepared to receive TENDERS for supplying and erecting on their works, adjoining the London and North-Western Railway, an IRON ROOF for a new retort-house, 70 ft. long and 51 ft. 9 in. wide.

Drawings and specifications may be seen at the Company's Office, Rugby; or copies of the same may be had by enclosing 5s. in postage stamps to the undersigned.

Tenders must be sent to the Secretary (T. M. Wratislaw, Esq.), under cover to the Chairman, on or before Twelve o'clock at noon on Monday, the 30th day of August, 1869.

The Directors do not bind themselves to accept the lowest or any tender.

P. SIMPSON, Engineer and Manager.

Gas-Works, Rugby, Aug. 11, 1869.

OSWALDTWISTLE GAS-WORKS.

COAL AND CANNEL WANTED.

THE Oswaldtwistle Local Board are

prepared to receive TENDERS for the supply of COAL and CANNEL to their works, situate adjoining the Church Station of the Lancashire and Yorkshire Railway, and in immediate proximity to the Leeds and Liverpool Canal.

The annual consumption of gas in the district is about 10,000,000 cubic feet.

Tenders may state price for a term of years, and must include carriage to Church by rail or canal.

Tenders must be sent to the undersigned, on or before the 21st inst.—By order,

W. GOURLAY, Clerk.

Oswaldtwistle, near Accrington, Aug. 10, 1869.

TO STOKERS.

WANTED, immediately, for the

Witham Gas-Works, a good STOKER. One who is acquainted with gas work generally, sober, industrious, and of good character.

Address R. ROBINSON, Manager, Gas-Office, Witham, ESSEX.

Aug. 10, 1869.

TO GAS COMPANIES.

WANTED, by the Advertiser, an

appointment as SECRETARY or MANAGER, where the annual make of gas is from 10 to 15 million cubic feet. He has had several years experience in both departments, and now holds similar capacities in a provincial gas company.

Unexceptionable testimonials as to competency, integrity, and sobriety, from chairmen of gas companies and gas engineers; and the highest recommendation from present employers.

Address A. M. H., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

TO MANAGERS OF GAS-WORKS AND OTHERS, TOWN OR COUNTRY.

AN experienced Man is in want of a

situation as METER INSPECTOR or FITTER. Reference given.

Address J. P., No. 7, Pleasant Row, STEPNEY GREEN, E.

SECRETARY AND MANAGER.

WANTED, a Gentleman to undertake

the duties of SECRETARY and MANAGER to a gas company. Must be thoroughly conversant with the manufacture and distribution of gas, and also acquainted with book-keeping and the general duties of a secretary. Salary £150 per annum.

Address, stating age, and last engagement, to W. STENNING, Esq., Chairman, Red Hill, SURREY.

GAS SUPERINTENDENT.

WANTED, a Superintendent for a

gas company on the West Coast of South America. He must be an unmarried man, and have had experience as superintendent of a gas company.

Address by letter, in applicant's own handwriting, stating age and qualifications, to MATHESON AND BEAUSIRE, 36, The Temple, Dale Street, LIVERPOOL.

WANTED, a Resident Engineer for

a gas-work near London, producing between 80 and 90 million cubic feet of gas per annum.

Applications, enclosing testimonials and stating salary, to be forwarded on or before Monday, the 23rd inst., under seal and by letter only, to the Secretary of the Wandsworth and Putney Gaslight and Coke Company, High Street, Wandsworth, endorsed "Application—Resident Engineer."—By order,

ALFRED LASS, Secretary.

Wandsworth, Aug. 6, 1869.

EDGE'S Patent for Removing the

CARBONACEOUS INCRUSTATION from GAS-RETORTS.

For particulars and terms, apply to E. GODDARD, Sole Agent, Gas-Works, IPSWICH.

W. J. SIMMONDS,

Retort and Boiler Setter and Contractor for Gas-Works in general,

7B, SOUTH STREET, NEW NORTH ROAD, ISLINGTON, LONDON, N.

Upwards of 16 years Retort Setter to the Chartered Gas Company, Brick Lane and Curtain Road Stations.

Materials supplied on reasonable terms if required, or labour only.

No connexion with any other Retort Setter.

N.B.—Orders to be addressed as above.

PRICE'S PATENT LAMPLIGHTER

is recommended to the notice of Gas Companies and local authorities as effecting a great saving in the consumption of Gas and of public lighting.

For particulars apply to R. E. KEEN, 11, Red Lion Court, Fleet Street, London, Sole Agent. Manufacturers, D. HULETT AND CO., 55, High Holborn, LONDON.

"FIVE MINUTES' TALK ABOUT GAS"

Is intended to be given by Gas Companies to their Customers. It is hoped the advice it contains may be the means of correcting mistakes and preventing accidents; and also of assisting the Officers in some of the most difficult of their duties.

Price—1000 copies, £1 17s. 6d.; 500 copies, £1 1s. 6d.; any smaller number, at 5s. per 100.

When 1000 copies are ordered, the official title and address of the Company will be printed on the first page without charge. Any greater number by special agreement as to price.

Apply to J. O. N. RUTTER, Black Rock, BRIGHTON.

Price 21s., bound in cloth, lettered,

THE SEVENTEENTH VOLUME OF THE

JOURNAL OF GAS LIGHTING, WATER SUPPLY, AND SANITARY IMPROVEMENT.

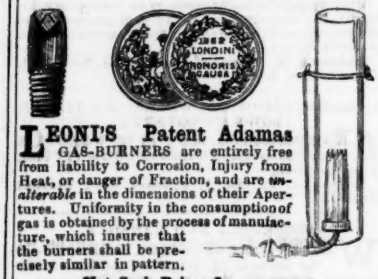
A Few Copies of Vols. III. to XVI. are still on Sale.

Cloth cases, gilt lettered, for binding Vol. XVII., are now ready, price 2s. 6d.

London: WILLIAM B. KING, 11, Bolt Court, FLEET STREET, E.C.

F. SIMMONDS, Senr.,
221, KINGSLAND ROAD,
RETORT & BOILER SETTER
For the Chartered Gaslight Company, Brick Lane and Curtain Road Stations, and numerous Gaslight Companies, London and Provincial.
NO CONNEXION WITH ANY OTHER RETORT SETTER.
Estimates given with or without materials.

UNIVERSAL PARIS EXHIBITION, 1867.
PRIZE MEDAL in Class 24—Heating and Lighting—for Leoni's Patent Gas-Burners and Gas-Stoves.



LEONI'S Patent Adamas GAS-BURNERS are entirely free from liability to Corrosion, Injury from Heat, or danger of Fraction, and are *unalterable* in the dimensions of their Apertures. Uniformity in the consumption of gas is obtained by the process of manufacture, which insures that the burners shall be precisely similar in pattern.

Net Cash Price, 8s. per gross.
Patentee and Sole Manufacturer, S. LEONI, 34, St. Paul Street, New North Road, LONDON, N.

HENRY F. WILLEY,
GAS ENGINEERING WORKS,
BARTHOLOMEW STREET, EXETER,
MANUFACTURER OF EVERY DESCRIPTION OF GAS APPARATUS,
Invites particular attention to his
GAS-METER DEPARTMENT,
Where he manufactures both WET and DRY METERS, several hundred of which are in use in many Gas-Works in England, Ireland, and Wales.
These Meters have received the highest praise from many eminent Gas Engineers, for their excellence of manufacture, superiority of workmanship, and accuracy of register. They are warranted to measure correctly and not to vary. Every Meter manufactured by him maintained in perfect repair for a period of *five years*. All bear the Government stamp.
GAS-FITTING DEPARTMENT.
A variety of very beautiful and choice patterns and designs adapted for any character of buildings, including MEDIÆVAL FITTINGS for CHURCHES, &c.; Handsome STAR PENDANTS for ASSEMBLY ROOMS, &c.; CHANDELIERS, PENDANTS, BRACKETS, &c.
ENGINEERING DEPARTMENT.
Every description of GAS APPARATUS, comprising GASHOLDERS, STATION-METERS, GOVERNORS, CONDENSERS, PURIFIERS, RETORTS, SLIDE-VALVES, and every article appertaining to Gas-Works.
Gas Companies advised on Improvements, Extensions, and Alteration of Works.
*** The very best material and workmanship guaranteed, and at prices bearing a favourable comparison with any House in the Kingdom.

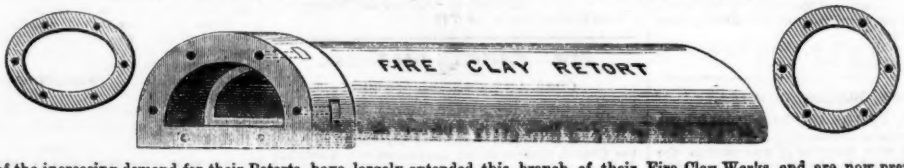
PATENT DRY GAS-METERS,
MANUFACTURED BY
D. BRUCE PEEBLES,
ENGINEER & GAS-METER MANUFACTURER,
FOUNTAINBRIDGE WORKS, EDINBURGH.

D. BRUCE PEEBLES having commenced a new manufacture in DRY GAS-METERS, begs to call the attention of Gas Engineers to its special advantages.
The meter-case is made of strong tinned sheet iron, which will withstand oxidation even in damp places for a very long time, and is not liable to be broken by a blow or fall, while the weight is not one-third of those in cast iron.
The construction of this meter is so simple that a few screws only are required for fitting, and it can be taken to pieces and refitted with a facility hitherto unattainable.
The jointing is novel, simple, and effectual, and is made with a minimum of cement or putty.
The whole of the working parts can be got at in a few minutes, without a soldering bolt, and can be cleaned, refitted, and set to work without the resetting of valves and levers—an operation found to be very troublesome with ordinary dry meters, and only practicable to an experienced workman. With this meter any one who can handle a screw-driver may take to pieces, clean, and refit the whole with the greatest ease.
D. B. P., while thanking the many friends and customers who now have his wet meters in use, begs to state that the same care and attention to the quality of workmanship and materials which are given to that branch will be extended to the dry meter manufacture, and he trusts by constant personal attention to merit a continuance of that patronage which already has been so liberally bestowed.

*** **The 3-Light Dry Meters are now ready for delivery, and other sizes are being proceeded with as rapidly as possible.**

PATENTED MARCH 11, 1869.
IMPROVED TIN-PLATE CASED DRY GAS-METERS,
WITH SPECIAL FACILITIES FOR ADJUSTING AND REPAIRS,
The principal parts of the mechanism being accessible by the removal of a single screw.
FULLERTON, SON, & CO., EDINBURGH,
SOLE MANUFACTURERS.
Consumers Wet and Dry Gas-Meters in Cast-Iron Cases, Station-Meters, Gas Apparatus, &c.
DRAWINGS ON APPLICATION.

THE FARNLEY IRON COMPANY,
FARNLEY, near LEEDS,



In consequence of the increasing demand for their Retorts, have largely extended this branch of their Fire-Clay Works, and are now prepared to execute the most important orders, either for *home* or *export*, with great punctuality.
The Fire-Clay raised from the Farnley Estate (commonly called the Wortley bed) is unsurpassed by any other known in the district, and is peculiarly well adapted for Retorts, Gas-Ovens, and Fire-Bricks; and the F. I. Co. beg especially to invite those connected with Gas-Works, who have not yet used their Retorts, to be good enough to favour them with a trial.
The F. I. Co. generally hold in stock, for immediate supply, Fire-Bricks of every size and kind—Tiles, Sanitary Tubes, Ornamental Terra-Cotta Ware, White Facing Bricks, the White, Buff and Salt-Glazed Bricks, &c., &c.
Prices, Drawings, and all other information may be obtained by applying as above, or to
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The actual working, as reported by one of the largest gas companies in Yorkshire, gives results still more favourable, viz—

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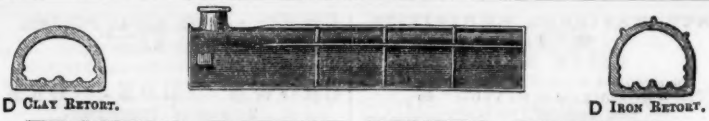

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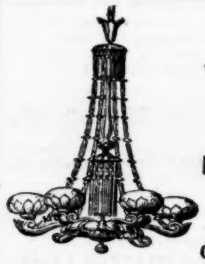

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TABLE GLASS OF ALL KINDS.
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Iron and Fire-Clay Retorts.
Annular and Pipe Condensers.
Scrubbers and Purifiers, all sizes.
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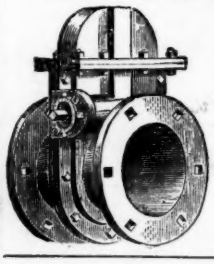

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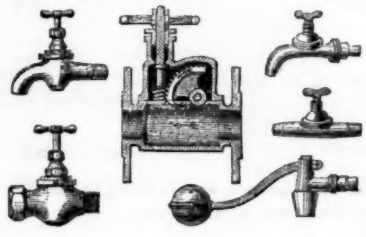

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"The results have been very remarkable, for they show an average increase of 63 per cent. on the illuminating power of the gas. I am of opinion, therefore, that the invention is of great practical value."

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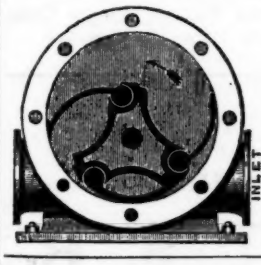

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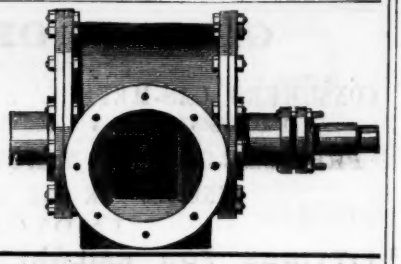

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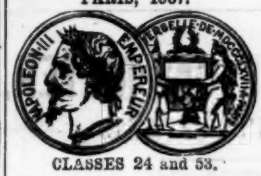

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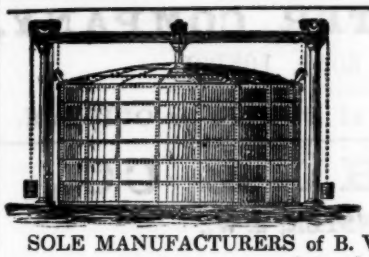

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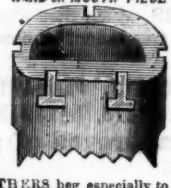

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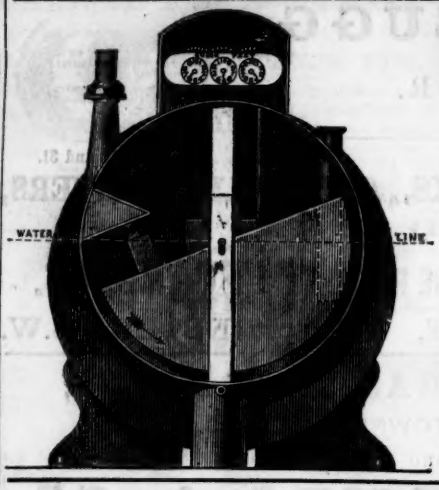

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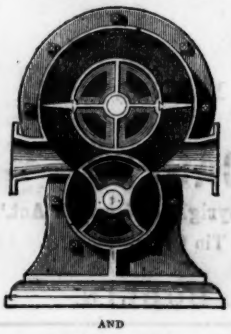

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